

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—36TH YEAR.

SYDNEY, SATURDAY, DECEMBER 3, 1949.

No. 23.

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The Sir Richard Stawell Oration.¹

"FOR HE HAD GREAT POSSESSIONS."

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I AM deeply conscious of the honour that has been afforded me tonight in the invitation to join the ranks of the Sir Richard Stawell orators; but the pride and the pleasure of the most recent recruit were indeed humbled when he read the orations of the past.

Thanks to the wisdom and generosity of Dr. Alfred Rowden White, here is enshrined a portrait gallery. Each orator had known Richard Stawell personally in some sphere and each has contributed a brightly shining facet from this association until there now exists an enduring mosaic as sincere and as sensitive as the portrait by Julian Smith, another friend of Richard Stawell; but there is more: each orator has left clearly imprinted for posterity his own personality. Last year it was seemingly that a profession other than medicine should provide the oration, as Richard Stawell was more than a doctor of medicine, and his influence extended far beyond his consulting room and his hospital wards. I would perhaps have wished to tell of Richard Stawell as a soldier, with his heritage of the senior service on his mother's side; but Sir Trent Champion de Crespigny has splendidly painted this picture beyond my simple palette. His story of Stawell during the

Gallipoli campaign of 1915 is fascinating in its intimacy and understanding. This was a splendid episode in a life of splendid service, when Stawell was prepared to lay down his life for his fellow men and came near to doing so.

Perhaps tonight in my humble sphere I may contribute another facet if I may be excused when I intrude my family and myself into these remarks.

My mind goes back to a year early in this century. The British Empire had been stunned by the postponement of the coronation of Edward VII on the advice of his surgeon, Sir Frederick Treves; the royal appendix was inflamed and the age of popular appendicectomy was about to be born.

Simultaneously (to my secret and somewhat snobbish delight) my brother suffered from the same complaint, and Richard Stawell, who had been a fellow student with my father, was called in. Vividly I remember hiding behind a curtain in our hall when Dr. Stawell was announced, and I shall never forget the effect of hearing for the first time his quiet, calm but confident voice. The door of the sickroom was ajar, and to the unpardonable shame but enduring delight of a very small boy I listened to his questioning.

A few years later, I myself was taken as a patient to the consulting rooms in Spring Street. I was apparently rather cranky—you all know the cranky child, the subject of those distressing advertisements for what is claimed to be a mild and palatable corrective. Clearly I recall that visit. I spent what seemed a long time in the waiting room not daring to move or look at the papers, while Dr. Stawell talked with my parents. Then, taking me by my little hot hand, he led me into his consulting room. This room was comfortable—it was quiet and there were flowers by the window. Dr. Stawell seemed so kind, I remember his kindly confident hands, his kindly smile; "You are all right, Frank"—and I knew I was all right.

Stawell advised that I should be turned out to grass in a little country private school for a few months. No

¹Delivered at a meeting of the Victorian Branch of the British Medical Association on October 5, 1949.

frightening laboratory investigations, no series of specialists, no physis, not even a psychiatrist—just common sense, for after all what is not common sense is generally common nonsense. It is not for me to say whether or not I ceased to be cranky, but apparently I became bearable to my family and to my companions.

Later I was to come under Stawell's influence during my medical course, when as a student I attended the out-patient department of the old Melbourne Hospital. Richard Stawell was one of my first clinicians, and he conducted his class beyond the out-patient halls into the wards and into the pathology department. In his thorough manner he tried to develop in his students an understanding of the course of disease. Later as a practising paediatrician I was on many occasions to be guided and entranced by the wisdom of Sir Richard Stawell in consultation. He was sound, simple and wise—confident and quiet, and the cement of all these qualities was a delightful, quiet, keen sense of humour. Perhaps these are the qualities that we miss so much today—soundness, simplicity, wisdom, confidence and quietness.

Such is our hurry to ensure material security and success that we are often reluctant to pause and to consolidate. True success once achieved is so obvious that the sacrifice and patient industry which lead to its attainment are not always apparent to those who rush. As far as I know, great effort and sacrifice must lie behind any enduring success. These essentials seem costly and are not always heeded when the world is so much with us—in this age of giving so little and taking so much. While the advances in medical science have demanded a development of specialism, they do not necessitate the shattering of such science into a series of specialties. A sound knowledge of basic general principles would often obviate the unfortunate practice of submitting many patients to a metaphorical dismembering and an impersonal rationing among a series of special departments.

There is an interesting story in one of Conan Doyle's earlier books—"Round the Red Lamp". Two young medical men fresh from academic erudition and modern hospital practice, settled in a country town which had been served, up to that time, by an old family general practitioner. Daily their scorn developed of his old-fashioned ways. An epidemic of influenza struck the town and one of these brilliant young men fell ill. After a few days his wife was about to send for his young colleague; but no, the sick man in his hour of personal need decided to summon the old doctor. Reluctantly his wife agreed to ring, but she was told that there would be some little delay before the old doctor could call, as he was answering a summons from the other young doctor who was also down with influenza.

One cannot think of Richard Stawell without appreciating his breadth of sound general medical knowledge and his humanity. Realizing the place of preventive medicine at a time when social medicine was little appreciated, Stawell studied for and achieved his diploma of public health in London. Such is our hurry and haste for specialist knowledge that we often do not afford time for the study of mankind, which Pope assures us is the proper study of man. Without this study I venture to suggest adequate assistance cannot be given to the sick. Richard Stawell talked with his patients in the Melbourne Hospital as if they were unfortunate worried human beings—which is just what they were. Unless we have experienced a serious illness it is difficult to appreciate the potency of the anxieties and fears engendered by sickness. These are seldom voiced, and as a consequence become distorted and exaggerated beyond the reason of well-being. Stawell had the happy faculty of understanding, and in simple language he helped and solaced. Often we can cure, generally we can relieve, always we can comfort.

Stawell was simple. This word has been so abused that its sense is almost synonymous with silly; but as applied to Stawell simple is used as the antithesis of complicated. This is a complex age because we make it so. Our speech is complicated, we arrive at a conclusion by a complicated and often confused course of thought. We look askance

and often with suspicion on simplicity; and yet how often is simplicity synonymous with courage and honesty! In a complicated and cloudy discussion Stawell in a few simple phrases would clear the fog of thought and determine a decision. A rare but inestimable quality—the ability to come to the point simply, positively but politely and with grace. Stawell made it all seem so easy. He was so sound, so simple.

Stawell was wise. Knowledge fades, but wisdom lingers. From many spheres of life people turned to Stawell because of his wisdom. Most of us forget that simple sound principles can be applied with advantage to most problems. It is when we so forget, and when we think that every question, every problem, must be approached anew, that we muddle, flounder and delay. Stawell impressed upon us as students the tremendous importance of being quite sure of what we were trying to do, of having a definite objective, and the first principle of war, maintenance of an objective, is also a first principle of peace.

This absence of thought before action is another product of our haste. Richard Stawell was never in a hurry.

So many and so apparently diverse are the problems of medicine nowadays that a vast range of what may be termed "technicalities" must be mastered. As a result, it is often considered that a mastery of these is the sole necessity for success. But to whatever heights our technical knowledge or skill may rise, without wisdom technical acumen cannot succeed. Stawell had access to the techniques of his profession—but he had far more, he had the wisdom to weigh these. Stawell was very wise.

Stawell was confident. To be confident does not imply conceit, arrogance or aggression. Confidence is compatible with quietness, as was so in Stawell's personality. Confidence should be the outcome of knowledge and wisdom. Knowledge comes from personal experience and thought. How confident was Stawell and how helpful and how assuring and infectious was his confidence! One did not think of doubting Stawell.

Stawell was quiet. What a tremendous impression is created by quietness!

I remember the night of the opening battle of Damour. Damour, just south of Beirut, was the last stand of the Vichy French in the Syrian campaign—a natural defensive position strongly held along the river crossing the narrow coastal plain at the foot of the towering Lebanon mountains. Our guns were massed in an olive grove behind some hills to the south, and just before midnight on that wild night they suddenly began their battering salvos. We drove around the coastal road to see this opening phase, and as we came high above the sea around Cape Nebi Yunas where Jonah is said to have been cast from the belly of the whale, the olive grove was flashing with gunfire less than half a mile away; but with the wind blowing strongly from the Mediterranean there was no audible sound and the effect was one of unreality. Shortly afterwards we awoke one night in our bivouacs above Sidon—something strange had happened, there was a silence, a blessed silence, the guns had ceased, there was an armistice. Those of you who have experienced greater gunfire must recall the deep impression of its cessation.

It was an unforgettable experience in New Guinea to march through the twilight of the rain forest high in the Owen Stanley Ranges. Thousands of soldiers silently plodded their weary way over miles of that sodden Kokoda Trail, carpeted to a depth of many feet with soaking moss and grotesquely glowing phosphorescent fungi. The only sounds in that eerie stillness were their laboured breathing and the clinking of their weapons and equipment.

In the research building of the Radio Corporation of America in New Jersey, we were taken into a soundless room; curtains of thick felt hung around the walls, an ordinary voice broke the dull dead silence like a catastrophe. In certain parts of Oxford and in the city of London the streets are paved with rubber blocks, and the vast traffic results in almost a pleasant hum.

Noise as we now know it is a product and a penalty of our progress. The world pattered along fairly quietly for the first eighteen centuries of the Christian era. Floods, famines, fires and pestilence took their toll and

the over-all world population apparently remained fairly steady and presented no problems. Then came the age of mechanical industry, and close on its heels the slow realization that health was a social problem as well as an individual one. People began to crowd into industrial centres and new events began to occur. As a result of these events we live now in circumstances vastly different from, and in certain ways vastly better than, those of mankind before.

We have gained many things. Our likelihood of surviving the first year of life is greatly increased and we have a reasonable expectancy of a longer life. More of us have better homes, better clothes and better food. We can move about more freely and with more comfort. We know a deal more about many more things, and during the past fifty years, physical, visual and auditory forms of transport have materialized the boast of Puck with their girdles round the earth. Considerably less effort is demanded and yet more security and comfort have been achieved. Now that we have gained these and much besides, it is not easy to record what we have done with them. It is simpler to recount some of the things we have lost or are losing. Our musculature is losing grace and power, our effort is diminishing. We are losing our teeth, our eyesight is failing, and one sad penalty we are paying is the losing of the loveliness of quiet murmurs and mists and gentle tones, lost in a cruel *crescendo* of crude contrasts.

Considerable research has been directed to the trauma or injury of noise or *echeosis*. It has been shown that the child even before birth is affected by noise. Experiments would indicate that if a mother is carrying a child and is subjected to loud noise, the unborn child may move as if disturbed. It has been demonstrated in the business world that by an adequate reduction in the noise level the average efficiency of office workers may be materially increased. But it is a commentary on our civilization that many of the quiet inquiries of peace receive a violent inspiration only from war. When it is necessary to maintain as many men as possible fit to fire a rifle or release a bomb, then effort and money are unstinted. Malaria was known to kill at least six million people each year before the war; yet only with the challenge of disappearing divisions in the South-West Pacific area brought about by a suppressible or a preventable disease was intensive study given to its control.

The League of Nations was quietly considering the problem of national nutrition; but only when strangulation of the United Kingdom lines of supply was threatened by submarines was practical consideration given to the problem, and as a result during the war more people in the United Kingdom were better fed than ever before.

War does not bring about any circumstances unknown during peace, any more than does war change a human being. War is associated with a senseless exaggeration and accumulation of all the trials, the triumphs and the disasters of peace, and this challenge raises the good in man to a tremendous height and lowers the bad in him to an unbelievable horror. The wounds of war, mental and physical, are all available during peace, as conflict of some kind is inescapable in our existence. It had long been recognized that the noise of certain trades was prejudicial to industrial efficiency; the hazard was most pronounced among boiler makers and those who rivet in closed spaces—fatigue and deafness being the end products. When it was realized that the noises of war were contributing to the inefficiency of fighting personnel, considerable research was stimulated towards their study.

Sound is perceived because the waves or vibrations which are produced at its source are received on the ear drum; from the ear drum these stimuli are transmitted by the beautiful mechanism of the middle and inner ear to minute nerve endings, which in their turn transmit these impressions to the auditory area of the brain where they are translated into what we recognize as sound.

During the war years the Flying Personnel Research Committee in the United Kingdom, the Committee of Medical Research of the Office of Scientific Research and Development in America, and Mr. N. E. Murray and

Captain G. Reid in Australia, were active among others in this study of noise as it affected fighting personnel, and there are several important publications of their work.

Many of these records are necessarily highly technical and sadly, during the war, highly secret. They soar into the realms of decibels, frequencies and audiometry beyond the comprehension of most of us; but certain basic findings are understandable and of great importance.

Improvement in audiometry—the measurement of hearing—was one of the first results of this work. A more accurate assessment of hearing changes became possible. Carefully controlled experiments were carried out with service personnel and with animals, in order that subjective effects as well as structural changes in relation to noise could be studied.

While this research failed to demonstrate any measurable effect of noise on certain psychomotor responses, such as heart beat, brain waves and respiratory rate, it was demonstrated that noise may produce fatigue as well as hearing changes.

Such fatigue and hearing loss may not be perceived by the subject, who may not be aware of any hearing impairment, and generally the speaker is thought to be at fault.

The effects vary with individuals, and by individual reflex action some degree of protection may be gained by contraction of the intraaural muscles or by the development of a toughening of the basilar membrane comparable with the development of thick skin on the soles of barefoot walkers.

Bone conduction of sound is diminished *pari passu* with loss of high-tone air conduction. On the subject's exposure to a hazardous sound, hearing loss develops most rapidly at first, then more slowly, and provided the exposure is not adequate to produce permanent change, normal hearing returns within a few hours, again more rapidly at first. After complete recovery subsequent similar exposures do not appear to lower the threshold to permanent loss; but cumulative effects may occur if exposure is repeated before recovery is complete.

Discomfort produced in the ear by a tone or a noise is not a good indication of its effectiveness in producing hearing loss, because the amplitude of sound waves producing discomfort or pain by stretching or irritating the ear drum and perhaps the suspensory ligaments of the ossicles, does not greatly affect the sensory cells of the inner ear until their intensity is well above 130 decibels.

The impairment of hearing produced by exposure to a hazardous sound may not be simply a loudness loss—there may also be a distortion; a pure sound may be heard as a rough, a buzzing or a double sound, and as a consequence there may be misunderstanding of speech. The higher the pitch of the sound, the greater its hazard.

The structural changes associated with this traumatic hearing loss have been demonstrated in animals to involve the cochlea, where the lesions may vary from a slight change in the cytoplasm of some of the external hair cells of Corti to complete disappearance of this organ.

This work was stimulated because the noises of an aeroplane—the propeller tips, the engine and exhaust, the slipstream, and the injury by gunfire—were rendering certain fighting men less efficient. Methods of protection against these sounds were devised, from ear defenders to packing of the aeroplane hull with aluminium foil; but what care has been directed to the civilian in the city streets? The vibrations of war, like the wounds of war, are present in our peace. One of the great penalties we pay for our practical progress is the penalty of vibration.

Just as life on this earth would be impossible in the absence of certain bacteria while others are deadly, so may vibrations be helpful or harmful.

Certain people deprived of physical vibrations would remain effortless or ineffective, and many of our pleasures and impressions are perceived by means of various vibrations. But there are others, and these were recounted by Dr. J. L. Cumpston, in his address on "The Public as Partners in Progress".

There are sound vibrations resulting in an incessant sequence of unnatural, unnecessary and unnerving noises; there are vibrations of sight produced by objects moving at a rate beyond the comfortable accommodation of the muscles of the eye and by a startling kaleidoscope of contrasting primitive or synthetic colours outside the range of neutral colours for which our eye is normally adapted. In addition we have the possible hazard of the vibration resulting from the electrical field in which we city dwellers pass so much of our lives.

Attention has been directed with much success to the reduction of the bodily vibrations of modern transport; but our ears and our eyes are neglected, to suffer the auditory and visual insults of our modern times.

When the hard-working farmer comes to a city he tires easily. The unyielding pavements are generally blamed; but rather I suggest it is the unaccustomed loudness that proves tiresome, and it is surely the quietness of colours and sounds in the country that is so restful to the city dweller. "Noise", wrote Florence Nightingale nearly a century ago, "is the most cruel absence of care", and we find that noise is associated with danger in the Bible. When Joshua and his host stood before the walls of Jericho down in the Jordan Valley, the seven priests made long blasts upon their seven trumpets of rams' horns, and at a sudden moment in the seventh day when the people shouted a great shout, the wall fell down flat and the city was utterly destroyed. In the old Stuart hymns we find the same association of noise and danger. Our city life is a life of loudness, of noise. We dwell in a din of iniquity. The hard rumble of wheels rolling on rails embedded in concrete, the blatant exhaust and the high-pitched threat of the klaxon predominate. No attempt has been made to streamline these horrors to conform with the outlines of the new motor-cars; rather is their shrill penetration enhanced into the hazardous frequencies of sound. In Tasmania and in Finland a klaxon is a crime, and their traffic casualties compare more than favourably with our own. When, as an escape, we rush inside and slam the door, we are met by a raucous radio, reminding us of savagery and things best forgotten as ungentlemanly. It has been said that a gentleman is one who can play a saxophone but does not. Perhaps we wrong the savage. In a recent report of a cinema executive who had visited the South Sea Islands investigating the film likes of natives, it was noted that these primitives frowned on boogie-woogie "musicals". The comment was made that under civilized rules the natives must limit their disapproval to frowning; but no doubt when they heard this strange noise their minds turned back to those earlier happy days, when in such a game they could "make it clubs".

Not only are our ears assailed, our eyes also suffer. When we remember that until the early years of last century the only street lighting was the small portable oil lamp carried by the link man on his rounds, and that from that time until sixty years ago when gas mantles were devised the streets were lit by a dim yellow flame of gas burning at a simple orifice, we realize what tremendous progress has been made towards turning night into day.

When Franz Winsor placed these first few lights in Pall Mall as a feeble demonstration of what could be done to light the streets of London, I wonder if he realized that he was the pioneer thief of our rightful night? Those new lamps were the talk and the jest of the town as the cartoons of the time display, and Sir Walter Scott described this effort as "lighting London with smoke". Such has been our progress since then that certain city streets—when there is no coal strike—become a red inferno, culminating in those arch fiends, the flicking, chasing, nystagmic neon lights, so dazzling, so offensive, so nasty. To appreciate the heights and the depths of this development, stand, if you can, by day or by night, for five minutes in Times Square without blinking.

Designed to command the ear and the eye, these tire-some things achieve exasperation and then exhaustion.

Most of us instinctively resent their presence and their intrusion into our world of sanity. Such defensive resentment precludes relaxation, and we suffer. So bankrupt are certain people of contentment and contemplation that they have a constant craving for new sensations, and noise has intruded into many of the quiet arts and entertainments, and very little effort is being made to curb the noises to which people submit themselves during their recreation.

Professor Burke in his recent George Adlington Syme Oration referred to change as the law of survival for all societies. At the same time he stated that an age of mediocrity not only dislikes the past, it fears it. These vibrants fear the value of the past so intensely that they run from it into regions of unreality. The spirit of adventure is to be encouraged. True adventure is healthy, has a logical beginning and is pursued within the realms of reason. But the strange efforts of these people ignore the basic truths of music, art or letters and are crudely insulting, and they have nothing translatable into common sense. Is there any more terrible word than nothing?

These abstract clashes of sound, of sight and of scrawl are often "the howlings and the crude cries of desperation, an extravagant attempt to over-value ability or the outcome of a suppressed conviction that there is no ability whatever". The cautious academic mind, fearing to be "caught out" in something it cannot understand, but fearing to say so, declares these crudities to be "very interesting"—an opportunist term devoid of honest definition. There is a strange reluctance to declare them as sheer impudent effrontery, offensive and bad.

Recently the President of the Royal Academy on a public occasion spoke his honest mind on certain forms of so-called "modern art", and a great soldier, himself a master of prose, was outspoken on so-called "modern verse". People were reminded of the legend of the cloak woven so finely that it was visible only to those who were above reproach. Any such comment is generally described as an "outburst of the ancients". Those of us who feel with Lord Munnings and Lord Wavell are stigmatized as insensate and ignorant of great events in the progress of art. If these things are progress, our ignorance indeed is bliss.

So that I may not be accused of speaking of people behind their backs, I am going to present to you examples of modern vibrations—gramophone records and films.¹

These strange things, these noises, these daubs, these masses, these scrawls, are said to have a meaning and a deep significance; with this we must agree, but let us at the same time announce that this significance is not discussed in decent society or generally exposed to public view.

By one of the most generous gifts of Providence we have no memory of pain. We can remember something as vaguely unpleasant, but the acuity of a past pain has mercifully gone beyond recall. With agreeable, pleasant and happy impressions it is fortunately otherwise. How often do we smile to ourselves at some happy thought or chuckle at some jest of other days! We may, if we so desire and possess the technical ability, sing or whistle a tuneful air from memory; most of us, having viewed a lovely picture or a noble figure in bronze or stone, can describe it to others. Having read some splendid prose or verse, we can memorize and quote it. But could any one here tonight reproduce those noises, describe that grotesque daub or that obscene shape or quote those senseless groupings of letters that have been demonstrated?

Even the devotees of "modern verse" have to read it—they naturally cannot remember it; these things have no relation to reality, physical, mental or spiritual reality, they are untruthful.

Our aurist colleagues reassure us that they are not aware as yet of any appreciable changes in hearing resulting from these vibrations of city sounds, nor do our

¹ Major-General Norris demonstrated "modern music" by several gramophone records and "modern art" and "modern verse" from lantern slides.

ophthalmologists report any progressive visual defects attributable to the city sights. But evolutionary changes are very gradual and are seldom if ever perceived until they have been achieved. Probably the primitive medicine men did not record any evolutionary changes in the foot—changes which have resulted in our loss of pedal prehension. It is indicated that conditions exist which must tend to bring about undesirable changes. That certain of these changes are with us may perhaps be inferred from the obvious effects of fatigue and anxiety that contribute largely to our invalidity. Professor Sir Kerr Grant has written recently on the power of sound vibration of a frequency beyond the human conception of sound. Controlled employment of these waves may be useful in insect destruction, as mosquitoes and large flies rapidly disintegrate on exposure. But with the development of jet propulsion—a potent source of “ultra-sonic” waves—the menace to human beings must increase.

An American scientist recently put this question to several thousand people: “If you had the power to decide what work scientists of the world should do during the next decade, how would you try to improve the world of today and tomorrow?” Some bizarre replies came back, but the suggestion “an invention to make the world less noisy” was voted the most sensible; already there is a murmur of disapproval of unnecessary noise. On a few of the hoardings in New South Wales we find a warning, occasionally letters of protest appear in the daily Press; but these are treated somewhat facetiously as in the reply of one gentleman who offered as his contribution “the invention of a silent foghorn for clear nights at sea”.

But this is no laughing matter. We cannot ignore nor stay the tide of progress, nor like Canute should we attempt to do so. Unfortunately the ear does not possess an external protection similar to the lid which guards the eye, and we are unable to pull down the blind and exclude a noise. Nor should we run away from it. But surely, if we have any belief in the higher purpose in progress, we cannot stand aside if any progress is directed towards that which is bad; even if we cannot dam back a river we can divert it. This is simpler if we face the problem before, like the Colorado, it cuts a canyon in the earth.

I can imagine no more worthy appreciation of the qualities of Richard Stawell, nor of the wisdom and generosity of Alfred Rowden White, than a successful crusade against unnecessary noise. Let each of us who values these qualities determine that he will be such a crusader—an active, earnest, militant crusader.

A very interesting experiment has been conducted continuously during the last thirty years in Munich, in spite of the severe bombing of that city. Dr. Hans Heck, the director of the zoo, has turned back the hands of the clock. In the scientific breeding of animals it is the practice to cull or reject from each generation those young which demonstrate recessive characteristics prejudicial to progress along a desired line. Dr. Heck, by careful selection among these rejects and by matching the right atavistic combinations, has continued to breed as it were backwards. As a result of this careful study, types of animals long extinct have been brought back to this earth. It is surmised that at some stage this evolution in reverse will be stopped and a forward development begun again as it was centuries and centuries ago—but towards a different line.

Dr. Hagerdoon, of Denmark, has recently been in Australia advising us about line breeding.

Finally, and perhaps in a flight of fancy, one wonders if, a successful search having been made for those who possess the rare qualities of Richard Stawell and above all his impressive quietness, such an experiment in eugenics as that of Dr. Heck could not be applied with these golden genes to the benefit of the human race. For when we remember that the lifetime of Richard Stawell was devoid of many of those noises demonstrated tonight—how he would have shaken his noble head in bewilderment!—and when we recall his splendid qualities, we can feel confident indeed that Richard Stawell had great possessions.

PINK DISEASE, WITH A CLINICAL APPROACH TO POSSIBLE AETIOLOGY.¹

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In the preparation of this paper for presentation to this session of Congress an attempt has been made to review one's experiences with this disease from 1935 to 1947 inclusive. The former year was the last occasion on which this subject was placed in comprehensive fashion before members in Australasia, when it was presented to the 103rd annual meeting of the British Medical Association held in Melbourne in September, 1935. The paper then presented was prepared by the late Dr. A. Jeffreys Wood and his son Dr. Ian Wood, and provided a most lucid summary of the knowledge and clinical experience of the disease at that time; it was a great pleasure to hear the paper and the subsequent discussion under the chairmanship of Dr. Robert Hutchison, who was president of the Section of Paediatrics of the Congress.

Before formally presenting my paper I feel that it would be most appropriate if we honoured the memory of such physicians as Swift, Jeffreys Wood and Hobill Cole, and, as this is an Australasian congress, we should include Bruton Sweet of New Zealand.

As the time is limited it is not my intention to read the paper in full, but rather to present those aspects of the subject which may be most expected to promote helpful discussion. For this reason most emphasis will be laid on several clinical features which have been the outcome of this review and which, in conjunction with autopsy findings, may offer an approach to the aetiology of this particular syndrome so well known to, but so little understood by, paediatricians throughout the world today.

With these data and a few observations as to treatment it is hoped that this presentation may contribute in some small measure to the relief of these miserable little sufferers and their no less miserable and distracted mothers and fathers.

A review of pink disease has been made which covers all the clinical data available with reference to cases occurring during the years 1935 to 1947 inclusive. This includes infants examined by me in private and hospital practice, the case histories with all the clinical data, pathological laboratory reports, and autopsy findings concerning patients at the Children's Hospital, Melbourne, and a considerable number of case histories of patients examined in private practice by a large number of my colleagues. In all some 502 histories have been studied and various types of information concerning the disease collected and combined to form the subject matter of this paper, the more important facets of which will be submitted as the points for discussion.

For the purpose of statistical record 300 of these cases and their histories have been used, since with each one of these comprehensive data have been obtained, including such facts as sex, age at onset of the illness, month of onset, type of family, whether the patient was the only child or one of several, clinical findings, pathological reports, follow-up records, and autopsy details whenever available.

An analysis of these data shows that the sex distribution is approximately equal—there were 141 male patients and 159 female patients.

The data relating to onset of the illness have been assessed according to the age of the infant and the month of the year at which there was first noticed some departure from normal in the health of the child. Reference to the age of the child at onset shows that the great majority of these infants first became ill between the ages of six and twelve months, with an outstanding

¹Read at a meeting of the Section of Paediatrics, Australasian Medical Congress (British Medical Association), Sixth Session, Perth, August, 1948.

preference for the ninth month. The youngest infant was aged three months at the onset of the illness and the eldest was aged twenty-nine months when the first manifestations presented themselves. These data are clearly presented in Figure I.

Only children outnumbered those with siblings in the proportion of two to one.

In determining the month of onset of the illness each case history has been carefully examined, and from the details supplied the month of onset has been assessed by finding the time at which the infant first presented some manifestation of departure from normal health. For example, if an infant had been examined for the first time during the second week in June, and the history indicated that the patient had been "out of sorts" for eight weeks previously, then this particular infant would be regarded as having become ill during the month of April. This procedure has been adopted in each instance.

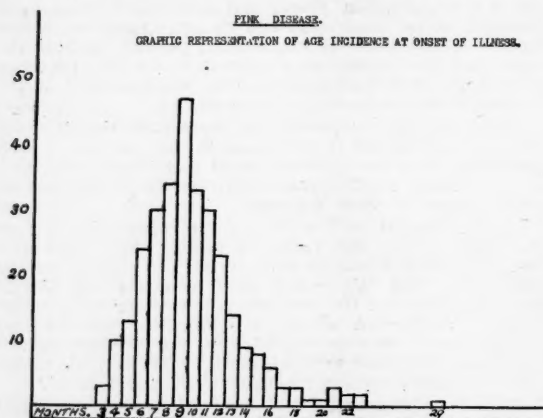


FIGURE I.

Graphic representation of age incidence at onset of illness.

When this information is set out so as to give a comprehensive picture of the disease over the thirteen-year period under review, it becomes apparent that pink disease will be prevalent for a number of months, at a time perhaps even reaching a "peak" at one stage, and then waning until there may be another period of two, three or four months in which there have been no cases. Admittedly this does not give the complete picture for the whole State, since pink disease is not a notifiable disease and it is not practicable to obtain data concerning all the cases occurring throughout the State for any given period. However, evidence seems to confirm a clinical impression formed by me and also commented upon by numerous colleagues over the years—namely, that a few cases of the disease would occur in fairly close succession during a number of months and that these would be followed by a "lull" in which none would be recorded for perhaps three or four months. On occasions this observation has been so definite that one would find in course of discussion with fellow practitioners a reference to the "pink disease season".

A record of the occupation of the father of the patient has provided no relevant information with regard to possible aetiology of the disease, apart from the fact that approximately one-half of these men have been employed in an occupation which entailed numerous contacts with the general public—they have been tram conductors, taxi drivers, policemen, salesmen, barmen, factory hands, munitions workers and so on.

Metropolitan cases are approximately twice as numerous as those occurring in the country districts.

Clinical Manifestations.

In respect of clinical manifestations there is little to be added to the information recorded on numerous

occasions by previous observers, but it is considered to be of sufficient clinical interest to refer to the most outstanding points and to quote some of the actual descriptions given by the mothers of these children with reference to the onset and course of the disease. It is believed that this information is of some significance in any description of the illness among these babies, because the mother is the one person above all others who is most closely in contact with these little patients, and she will naturally be in a position to notice the slightest changes in the infant if she is in the least observant.

Irritability.

Irritability is one of the outstanding manifestations; it may be first noticed as a change in temperament in the baby, so that he becomes "grizzly" and howls pitifully, whines like a dog, or has many screaming turns in which he may hold his ears or bang his head often on the floor or the side of the cot. Occasionally convulsions may occur or he may become quite unmanageable at home and must be "kept moving in the pram", especially at night, or he does not like being handled or he seems to be in pain except when in the warm bath. He may lie on his face in the pram with the legs drawn up under him, or he may lie in the prone position with the head in the hands. Sometimes he will lie curled up on one side with the legs drawn up as if in abdominal pain. Fairly frequently mothers remark that the little sufferer is much happier when in a comfortably warm bath than anywhere else. This is recorded as a practical observation and will be referred to again later in the section on therapy.

Whatever the manifestation in which this irritable state is presented, one thing is certain, and that is that it will become progressively worse for a number of weeks or months before there is any amelioration; the latter is sometimes the first indication of the early stages of recovery.

With this irritability persisting for a long period the infant soon presents the picture of abject misery and wretchedness; it is difficult to imagine anything more pathetic than a baby suffering from pink disease, with complete apathy and loss of interest in his surroundings.

Photophobia.

Photophobia occurs frequently and may be evident early in the illness; in fact, many babies have been taken to the oculist first on account of the sudden appearance of sore, red eyes, with profuse weeping, and have then been referred to the physician when no organic eye trouble can be discovered. The intense lachrymation persists for some days and the discharge from the eyes remains "watery" and the eyes remain very red in appearance, but only exceptionally does the conjunctiva become purulent. Strangely enough, the photophobia may be delayed in its advance until the disease is well established—even into the second or third month.

The mother will often observe that the baby is frowning a good deal, especially if he is in any bright light, and will turn his face away from the light, particularly if outside in the sunlight. The infant will be noticed to bury the head in the pillow or on the mother's shoulder, or may lie hunched up with the head on the pillow for most of the day. It is often remarked that the infant lies on his hands or knees with the buttocks in the air, or that he sleeps on top of the bedclothes, and will constantly cover the eyes with the back of the hands, especially if held up in the sitting position.

All these bizarre attitudes which the baby suffering from pink disease is noticed to adopt are simply his attempt to avoid looking at bright light of any description and are one of the most characteristic manifestations of the illness to the clinician. On some occasions the baby literally "grotes" around just as if he were completely blinded temporarily.

Weakness and Hypotonia.

Weakness and hypotonia are almost of equal importance; they may be of extreme degree when the condition is

well established, and they may even lead to suspicion that the illness is actually poliomyelitis.

The story often told by the mother is that the baby has "ceased to crawl" and has "lost the ability to stand" or to "sit up", all of which he could do well before the sickness. It may also be said that "he is not even standing now", whereas he was walking well previously.

The baby becomes apathetic and often absolutely uninterested in his surroundings, and he may appear to be unable to move unless helped. On rare occasions I have seen pressure sores or trophic lesions on the dorsal aspect of the toes, on account of the infant's lying constantly in the prone position and being too weak to change his feet from the one position, so that the skin on the toes or feet becomes chafed.

Another result of the extreme atonia is the fairly frequent occurrence of inguinal or umbilical hernia, or a pronounced general laxity of the abdominal wall. Rectal prolapse also occurs and may be persistent until the baby commences to regain some of his original tone.

If the infant is lifted up in the hands he is noticed to have become very "floppy" and tends to slip through the fingers.

Red or Pink Hands and Feet.

The red or pink hands and feet are very characteristic and in addition are particularly cold and clammy—the "raw beef" hands and feet. The mothers will tell of the swollen or puffy hands and feet, which are described as being reddish, pink, or bluish in colour, and always cold or moist, or "like a frog".

Often the tip of the nose and ears and the cheeks appear pink in colour, and they too feel cold.

In general, pinkness and coldness are present over the circulatory end points.

The extremities often peel freely during the course of the disease, which adds further to the itchiness and discomfort.

The Rash.

The rash is soon generalized; it waxes and wanes at first and then becomes persistent; it may be sudaminal, maculo-papular or "measly" or "scarlatinal" in nature, and with the profuse sweating there follows desquamation over the body generally, and from the hands and feet in particular.

Occasionally the buttocks may be deeply excoriated.

The rash is extremely irritable and is constantly scratched and easily secondarily infected, giving rise to extensive impetiginous lesions or even to very large trophic patches of skin over the trunk or limbs. In some infants, whose resistance is considerably lowered by the illness, pustules, furuncles or even carbuncular lesions may supervene, with an aggravation of the already severe toxæmia, and some of these babies die of septicæmia.

Early in the disease the coryzal symptoms and the rash may arouse an initial suspicion that the baby has developed measles; but the nature of the rash and its persistence soon exclude this possibility. The reddish-brown discoloration, together with peeling of the extremities, may suggest in a superficial way the likelihood of congenital syphilis; but the absence of other stigmata and the persistently negative response to the Wassermann test will serve to exclude this disease.

Sweating.

Sweating is an almost constant accompaniment from fairly early in the illness until late in its course, when its abatement is one of the indications of commencing recovery. It may occur locally about the scalp or a limb or in patchy fashion about the trunk, or it may be general and extraordinarily profuse, and on occasions offensive, giving rise at times to a so-called "mousey" odour. In some cases the fluid can be seen actually oozing from the skin surface when the child is stripped for examination, which provides ample confirmation of the statement often heard from the mother to the effect that the baby "is

simply dripping wet" or that it "runs off him". On a number of occasions it has been noticed that this perspiration is of such a character that it dissolves the surface coating of the diaphragm of the stethoscope chest-piece, leaving dark stains on the child's skin. Mothers have also commented upon the fact that this perspiration soaked into the underclothing will disintegrate or rot the fabric in a short time.

This very free skin action often dehydrates the infant to such a degree that intravenous therapy is indicated.

The sweating is also the basis for the skin rashes previously described, and predisposes the child to the secondary infection so often superimposed upon the sodden tissues as a result of scratching in an endeavour to relieve the intense irritation.

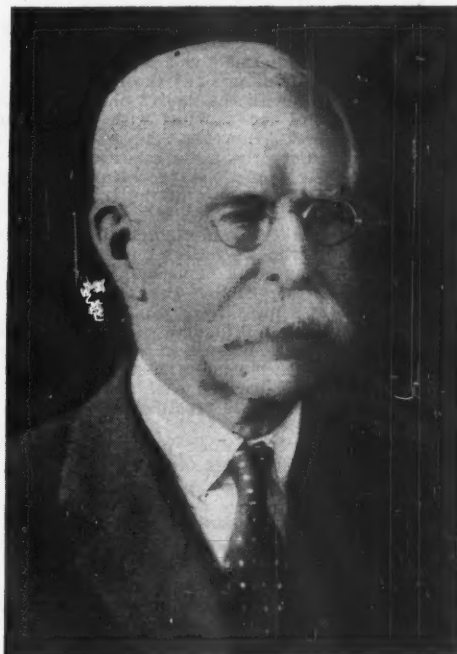


FIGURE II.
The late Harry Swift, of Adelaide.

Tachycardia.

Tachycardia is without doubt the most constant and persistent of all clinical manifestations encountered with these children. It is present at the onset and is maintained throughout the course of the disease, and what is even more characteristic, it is continued at exactly the same rapid rate even during the times when the infant does actually fall asleep for perhaps a few short periods at a time. This is strikingly shown when a chart is examined in which the sleeping pulse rate is recorded together with the pulse rate as estimated at various times during the day.

In the present series of 300 children there was only one whose pulse rate was consistently under 160 per minute, and in many the rate often reached 180 and even 200 per minute or more for rather sustained periods. This applied to the sleeping pulse rate also. These facts are well seen in the chart of a fulminating early case and in one in which improvement is beginning after a long illness.

A persistent pulse rate of 200 per minute or over is always viewed with considerable concern by the clinician, as it is assumed to imply a more or less severe degree of myocardial involvement; it seems only reasonable to conclude that the infant heart muscle cannot maintain this

rate for weeks at a time without grave risk of some permanent heart damage.

This, it is considered, explains the sudden death which is known to occur in these cases, sometimes after weeks of sickness and even when the general condition appears not to warrant undue anxiety. However, without exception every one of such babies who suffers a dramatically sudden *exitus letalis* has sustained and pronounced tachycardia.

Hypertension.

Hypertension is another commonly observed manifestation during this disease, and many of these young infants whose blood pressure readings have been recorded at varying stages of the illness have shown what is regarded as a definite elevation above the normal figures for their respective ages.

The estimations have been made with the "Tyco" or "Erkatonometer" types of anaeroid sphygmomanometer, checked at regular intervals against the mercurial instrument. A specially made small cuff for the infant's arm has been used, and on this account the readings may not be directly comparable with the figures obtained in adults with the standard-sized cuff supplied with the instrument by the manufacturers. However, the estimations have always been made under the same conditions with these babies, and it is felt that these recordings are reliable for comparison at various stages of the illness.

This is further confirmed when it is remembered that readings have been taken from time to time on infants of similar age groups who are suffering from other illnesses or who are regarded as being in normal health.

It has often been observed that the readings during the earlier weeks of the illness have been in the region of 130 to 140 or even 150 millimetres of mercury (systolic pressure) and 80 to 90 millimetres (diastolic pressure). These figures will often be maintained for months at a time and seem to be in parallel with the tachycardia; a drop to the normal figures is regarded as a sign of commencing improvement.

Normal readings for the same age groups are in the region of 80 to 90 millimetres of mercury, systolic, and 55 to 65 millimetres, diastolic.

Insomnia.

Insomnia is one of the most constant and distressing and obstinate accompaniments of the disease, and the one above all others which drives the parents almost to distraction through their inability to obtain even a modicum of rest themselves night after night for many weeks at a time. The mother will state that the baby is restless or cries all through the night, or wakes up screaming, or constantly kicks off the bedclothes. Another statement is that the child has cried all night for weeks and the mother is completely exhausted, or that the baby has not slept at night for six weeks, neither has the mother.

It is pathetic stories such as these which influence the physician on occasions to recommend the admission of the baby to hospital for a short period, in order to give the mother a short respite and so enable her to carry on the struggle afresh a few weeks later.

Stomatitis.

Stomatitis can be troublesome, painful and a debilitating complication, and is often first indicated by profuse salivation in the form of "dribbling", sore gums and ulceration of the mouth. The baby often grinds the teeth severely at night, and in some of the most severe cases teeth have been ground out of the gums; in the worst of all an infection has ensued, resulting ultimately in acute osteomyelitis of the mandible or a typical *cancrem oris*.

With the loss of sleep and appetite and the actual disability to take food on account of the extreme pain on trying to chew or even to drink, the loss of weight can be both rapid and severe, and the baby's general condition may deteriorate at an alarming rate.

Gastro-Intestinal Disturbance.

Gastro-intestinal disturbance occurs often either at the onset or during the course of the illness. It may be

associated with vomiting, diarrhoea, and apparently severe colicky abdominal pains at times. The baby at times cries and draws up his legs on his abdomen.

Previous Illness.

A history of a previous illness or infection from which the baby never seems to have recovered completely is given so often that the clinician feels that it may have some definite significance and be relevant in paving the way for the disease eventually to declare itself in its true light, perhaps owing to a lowering of the child's resistance by the first infection.

Pallor.

Pallor is often striking late in the course of the disease, and it may be the indication of a true anaemia when the blood picture is investigated.

Deaths.

A careful analysis of all the fatal cases has been made with post-mortem findings when these were obtainable, in an endeavour to establish some relationship between the pathological changes and the clinical picture, with the ultimate aim of finding any further clue as to the aetiology.

There follows a summary of the findings and the detailed post-mortem reports in a group of 33 fatal cases occurring at the Children's Hospital, which have been studied in this series.

In this group the post-mortem findings are recorded in 25, and in the other eight the cause of death was recorded on the clinical findings during the illness.

A careful study of these patients reveals that no less than 14 died from sudden circulatory failure and collapse, five of these in the absence of any other complications and when the infants seemed to be progressing reasonably well, but in each case after at least seven weeks of illness. In 23 instances there were indications of severe respiratory tract infection, such as bronchopneumonia, pulmonary congestion, bronchitis or bronchiectasis.

In 10 instances there were indications of inflammatory processes in the intestinal tract, including gastro-enteritis and entero-colitis, accompanied by enlarged and oedematous mesenteric glands, and on one occasion actual ulceration of the mucosa over engorged lymphatic nodules.

Other rarer complications were *otitis media* and mastoiditis and extensive skin infection, such as furunculosis and pustular dermatitis, and finally pyelonephritis.

It is thought that the high proportion of these patients who died of sudden circulatory failure is perhaps not unexpected in an illness affecting infants and lasting a number of weeks and accompanied by fever and a sustained pulse rate of 160 per minute or more throughout the day and night.

The proportion in which respiratory tract infections were a determining factor in the fatal issue further emphasizes the need for the generalization that these babies should be kept out of hospital if at all possible, in order to minimize the risk of infection by reducing the number of contacts and thereby lessening the possibility of coryzal contamination.

The presence of lesions of the alimentary tract in one-third of these infants who died during the course of their pink disease is considered to have some significance with regard to possible aetiology. It would seem not unreasonable to assume that the portal of entry of the infection could be by way of this route. (Compare present-day opinion on poliomyelitis.)

The other less common lesions are merely indications of a much lowered resistance to intercurrent infection. One child succumbed to leucæmia at the age of two and a half years after having suffered from pink disease at the age of eight months.

Case Histories of Special Significance.

The data relating to the following group of cases are regarded as being of special significance and worthy of record, as it will be seen that they would go to imply that there is a possible association of case-to-case contact and

a family predisposition to an infection with pink disease and to a group of known virus type of illnesses in children.

Case A.

Mrs. M. had two children, M.M., a male, and Y.M., a female.

The boy M.M. contracted pink disease at the age of six months, was desperately ill for many weeks and eventually recovered after nine months. This patient contracted his pink disease while staying in the same house as his cousin, aged ten months, who was suffering from pink disease at the time. He stayed in the house for eight weeks and his illness began four weeks after the contact with his cousin.

Y.M., the female child, never suffered from pink disease and has always been healthy.

Mrs. M. then married a second time and became Mrs. E.; she has had two more children, J.E., a female, and M.E., a female.

J.E. contracted pink disease when living in another State. She was eleven months old at the onset of the illness and was ill for four months and then slowly improved and recovered completely. This patient had been in contact with another baby suffering from pink disease at the time. She began to develop her illness about three weeks after the first contact with the other baby.

M.E. was first examined at the age of eight months; she had a history of coryza about two weeks before and of inability to sleep since. The mother was convinced that the baby was developing pink disease, because, as she described it, the baby was "going just the same" as the other two children did at the onset of their illness. "They all squealed" in similar fashion at the beginning of the illness. This patient's illness also ran the course of typical pink disease and she was ill for six months before she finally recovered. This patient had also been in contact with an infant who was supposed to have a "feverish cold" for ten days, but who eventually developed typical pink disease.

Here, therefore, we have an example of a mother who has suffered the dire misfortune of having had three children who have suffered from pink disease, and there is no need to emphasize that this mother has nothing further to learn with regard to symptoms, clinical signs and management of infants suffering from pink disease.

Case B.

L.T., a female patient, aged ten months, was suffering from typical pink disease of three months' duration when first examined in the month of December, and her illness ran a very protracted course for a few months longer before she recovered completely by the following August.

Approximately three weeks after she had been first examined, her cousin, a boy, M.B., aged nineteen months, was brought for examination as he had not been sleeping for the previous week and had "gone off his food" and whined constantly at night, "just as his cousin had done in the early stages of her illness". Surely enough, this baby manifested definite signs of pink disease when examined and his illness ran a typical course for the next four months.

One month after this baby had first been examined, his younger brother, aged seven months, presented with a suspicious history of loss of weight, anorexia and sweating at night for the previous two weeks, and the mother was apprehensive that this baby was heading for pink disease. Her worst fears materialized and the infant was ill for five months before recovering from a classical course of pink disease.

Here again is an example of two children of the one family stricken with pink disease almost at the same time, who present a history of contact with a cousin actually suffering from the same malady concurrently.

Case C.

A.B., a male patient, aged eleven months, was ill for three weeks with classical manifestations of pink disease before being examined. This baby had a cousin, aged nine months, also ill with pink disease. They had been in close contact on a number of occasions before A.B. first presented early signs. The cousin had then been ill for three weeks. Both babies had a rather prolonged illness for approximately six months, after which time they proceeded to complete recovery.

In all I am able to record personal experience of ten other patients with an equally definite history of direct contact with another infant suffering from the same disease at the same time. In each instance the diagnosis of pink disease in the "contact" baby has been confirmed.

Case D.

F.S., a male patient, aged twelve months, suffered from pink disease complicated by bronchopneumonia, but eventually went on to complete recovery after an illness lasting for six months. In the course of investigation it was revealed that in a period of ten years no less than five cousins of this baby had been under treatment for pink disease—three of them in Victoria and the other two in New South Wales.

Case E.

W.B., a female patient, aged eleven months, suffered from pink disease for three months and died suddenly from acute peripheral failure of the circulatory system. An elder brother of this child had also had pink disease at the age of thirteen months, and after being ill for nearly six months had recovered completely.

Case F.

E.T., a male patient, aged five months, was under treatment for five months for classical pink disease and, according to the mother, an elder child had died two years previously from pink disease.

Case G.

A.C., a male patient, aged ten months, was "out of sorts" for three weeks; his condition then declared itself as pink disease and he took a further four and a half months to recover completely. Four years later his younger brother developed a similar illness and eventually also ran the course of true pink disease, taking five months to recover.

Case H.

B.G., a female patient, aged fourteen months, was ill for seven months with pink disease accompanied by various minor complications and then proceeded to complete recovery. Investigation showed that a sister had suffered from pink disease three years earlier, at the age of twelve months, but had been ill for only three months in all and had been well since.

Case I.

F.C., a male patient, aged fourteen months, presented the typical manifestations of pink disease and was ill for six months before recovery. Previously this baby had suffered from an attack of varicella. Later he had a severe attack of mumps, after which he contracted measles, and later again had a severe bout of herpes zoster. Finally he had another illness which proved to be German measles. A brother had suffered from pink disease at the age of twelve months and was ill for five months. This boy had also contracted mumps, measles and an attack of herpes at the time the other infant had herpes.

Case J.

C.D., a female patient, aged nine months, had typical pink disease lasting for seven months. Later, at the age of three years, she had a severe attack of poliomyelitis, and subsequent to this was ill with varicella, measles and German measles. A brother had suffered from mumps, varicella, measles and German measles, and a third child, also a boy, had contracted varicella, measles and herpes zoster.

Case K.

L.O., a male patient, aged thirteen months, was ill with pink disease for four months, and at the age of four years had a severe attack of poliomyelitis. In addition he had also had mumps and varicella. Two other members of this family had suffered from mumps and varicella at the time when their brother was ill with these infections. The younger child had also had poliomyelitis and the elder had been ill with measles.

Case L.

D.A., a female patient, aged ten months, had a severe attack of pink disease, after which she developed in the course of the next five years measles, varicella, mumps and, lastly, German measles. An elder sister had suffered from poliomyelitis, varicella, mumps and German measles. A younger brother had also been treated for mumps, varicella, measles and German measles.

Discussion.

Sisters in charge of baby health centres have frequently reported that they have had four, five or six infants with pink disease attending, their particular centre simultaneously, and then there would be a period of perhaps

six or twelve months or more without their seeing a single example of this illness.

At the present time two sisters at the one centre have reported that they have in attendance no less than 13 babies in various stages of an illness regarded in each instance by a paediatric physician as pink disease.

Another sister has recorded that when she was in charge of four centres in the Gippsland area of the State there was scarcely a month in the year in which she did not have a baby with pink disease attending her centres. This same sister when stationed in the north-western portion of the State remarked that she had not seen one baby with pink disease during a period of five years.

Practitioners in the eastern suburbs in the course of conversation would recall that they had not encountered a case of pink disease for perhaps four years. Then one doctor would come upon two cases in his own practice in three months; at about this time one of his neighbours would comment that he had encountered three cases during a short period, and another colleague would also mention that he had examined two babies with pink disease during the same three or four months.

Several of their somewhat more distant neighbours would also have encountered probably one or two cases in approximately the same period of six or eight months.

Following this little "burst" of cases of pink disease there would often be a lull in these particular suburbs for several years. During this quiescent period in the eastern suburbs one would then encounter an odd case appearing in, for example, the north-western portion of the metropolis, and in consultation with one or two colleagues in this area the remark would be made that they had examined one, three and two infants respectively suffering from this illness in a relatively short space of time, whereas previously none of them had encountered a case for two or three years. Concurrently with this, odd cases would appear at hospital from these suburbs.

From full consideration of each case in which all the necessary information is available, including the month of onset of the illness and the location of the patient at this time, it becomes evident that the great majority of the patients concerned were living in that portion of the State of Victoria south of the Great Dividing Range; a smaller group was scattered along the Goulburn Valley, and a few were over the border into the Riverina area of New South Wales. Another small group was distributed along the course of the Campaspe and Loddon Rivers, with a few more along the Wimmera River.

By far the majority of the patients south of the Dividing Range were domiciled in the Gippsland area, and only a very small sprinkling were in the western district. A closer examination of this distribution reveals that the scattering is, if anything, more along the main highways or lines of communication (either by rail or by road) from the metropolitan area to the rural districts than according to geographical features. This is the impression gained by an overall consideration of the country cases for the thirteen-year period.

Consideration has also been given to the distribution of cases according to "bursts of activity" or phases mentioned in the discussion on the month of onset throughout this same period of years. It becomes evident that during one of these "seasons" most of the cases were in the north-eastern area, during another the bulk of cases were in the northern area, and in a third season they were mostly in the western area. Furthermore, during each of these "seasons" cases occurred at the same time scattered throughout the Gippsland area, and finally additional groups occurred which seemed to be restricted to the Gippsland area alone.

It may be said, in the summing up of these observations for the country portion of the State, that the disease is mildly epidemic in some regions, in that cases occur in one area during one or two years, and then are not seen in this particular area perhaps for several years. In the Gippsland area, on the other hand, it would appear to be almost endemic, with occasional local outbursts from year to year.

The same consideration has been given to the distribution of cases in the metropolitan area. The first impression conveyed on an overall inspection is that the heaviest sowing of cases is in the city and the more closely settled industrial suburbs, whereas the purely residential areas with much more in the way of open spaces have been much less severely involved. For instance, there is a thick scattering through Carlton, Fitzroy, Collingwood and Brunswick, also in the Richmond and Hawthorn areas. In the more purely residential suburbs Malvern has provided a greater number than most others. It is also evident that cases are distributed along the line of the White Horse Road through Camberwell, Surrey Hills, Mont Albert and on to Tunstall. Again, if we travel in a westerly direction from the city proper we find a fairly thick collection through Footscray, Seddon, Yarraville, Spotswood, Williamstown and Altona. Finally, there were many cases along the line through Flemington, Kensington, Ascot Vale, Moonee Ponds and Essendon, and a large group in Brunswick and Coburg.

Similarly, when the cases were separated according to "season", as was done with the country cases, it was most striking how in one of these seasons the great majority of the infected infants would be in the northern suburbs, the other areas providing only relatively few cases during that time. Perhaps in the next phase of activity the western suburbs will supply by far the majority of the cases to the exclusion of the rest of the metropolis, and so the sowing continues from year to year.

During each of these seasons there are always odd cases in other suburbs; but the main distribution would be in one direction in one or two years and then in an entirely different direction in the next ensuing period.

Another striking feature of the metropolitan cases is the comparatively sparse distribution in the bayside suburbs, such as Brighton, Sandringham, Mentone, Mordialloc, Chelsea and Frankston, even when the illness was more prevalent in other parts of the metropolis.

It is worthy of mention that this incidence of cases is reminiscent of that occurring with poliomyelitis, herpes, varicella and other known virus infections.

Summary.

The points to be summarized from this review of pink disease over the period 1935 to 1947 are as follows.

1. The age incidence follows closely the period of the first dentition, the maximum peak being in the eighth, ninth and tenth months.
2. The disease occurs in equal proportions in both sexes. Only children provide twice as many cases as those with siblings. City children affected outnumber country children in the proportion of two to one.
3. The disease has appeared in phases of activity with intervening lulls, in which no case has been recorded. These phases have been distributed in patchy fashion throughout the urban and rural areas, giving rise to so-called "islands" of the disease as described by Dr. Robert Hutchison.
4. Tachycardia even during the periods of sleep is an outstanding feature of the disease.
5. Sudden death with fulminating acute peripheral circulatory failure occurs in a high proportion of the fatal cases.
6. Case-to-case infection has been demonstrated in an appreciable number of instances in this series.
7. Family predisposition to pink disease and virus infections has been shown on an appreciable number of occasions in this series.
8. Post-mortem examinations have revealed the following: (a) respiratory tract infection and complications in a high proportion of cases; (b) alimentary tract lesions in one-third of the fatal cases (compare this with the autopsy findings in fatal cases of poliomyelitis); (c) no evident morbid anatomical changes to explain the sudden deaths from fulminating acute peripheral circulatory failure.
9. Laboratory investigations have failed to incriminate any bacterial organism as an aetiological factor.

10. Differential diagnosis may be extremely difficult in the early stages of the disease.

11. Sequelæ do occur in a small proportion of any large series of patients watched for a number of years after the illness.

12. Treatment depends upon: (a) nourishment, (b) rest, (c) avoidance of intercurrent infections.

Conclusion.

From the evidence collected from this review of cases of pink disease over a period of thirteen years the following clinical observations are believed to point towards the possibility that a virus type of infection may be an aetiological factor, with perhaps the alimentary tract as the portal of entry: (i) phases of activity of the disease occur from year to year, and islands of cases in both rural and urban districts; (ii) case-to-case contact is important; (iii) there is a family predisposition to pink disease and to known virus infections; (iv) the post-mortem findings in the alimentary tract are in accordance with such an aetiology.

Acknowledgements.

Before concluding this paper I should like to thank the Committee of Management of the Children's Hospital, Melbourne, and my numerous colleagues on the honorary medical staff for their generous permission to use the records of the hospital patients during the period under review. Especially should I like to thank my friend and colleague Dr. H. Boyd Graham for his assistance in making so freely available to me all his personal case records of babies suffering from pink disease, together with an enormous volume of references and foreign literature, many with his own translations, and I have no hesitation in saying that without his stimulating inspiration and great practical help in many ways this paper would not have come into being. To Dr. Reginald Webster also I tender my grateful thanks for all his assistance over many years past, and in particular for permission to use his excellent post-mortem records. In addition I owe a debt of gratitude to all those of my friends in the medical profession throughout our own State of Victoria, and in other States, for the time and trouble they have expended in making available for my use all the detailed case histories and records of their personal experiences with this fascinating and perplexing disease of children. Miss Aitchison, of the records office at the Children's Hospital, Melbourne, has been untiring in her efforts to supply all the available data from the clinical histories. Finally, I wish to record my deep appreciation of the help accorded by Dr. Brian Swift, of Adelaide, who sent me the photograph of his father, the late Dr. H. Swift, together with a short biography, and a treasured copy of Dr. Swift's original paper on "Erythroedema (Pink Disease)".

PERTUSSIS IMMUNIZATION: A COMPARISON OF PARENTERAL AND ORAL ROUTES IN MICE.

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THE claims made for the efficacy of oral immunization do not appear to have attracted the amount of scientific investigation its potential importance demands, especially in view of the increasing commercial use of oral vaccines. If parenteral immunization could be replaced in part or in whole by the oral method, it would have a profound effect on the practice of medicine. Many of the claims now made for oral vaccines are difficult to reconcile with modern bacteriological and immunological knowledge—so much so, in fact, that it is impossible in all but a few instances to provide the necessary biological conditions to test the truth of these claims.

THE HISTORY OF ORAL IMMUNIZATION.

The available literature contains few references on the subject of oral immunization. Ross (1926) records that Besredka (1918, 1919) claimed to have produced immunity against typhoid and dysentery by oral administration of the bacteria responsible for these diseases, and that Wilbert (1925) made similar claims for tuberculosis.

Ross himself, in a series of apparently well planned and carefully executed experiments (1926, 1930, 1931, 1932 and 1934), demonstrated that *Streptococcus pneumoniae* and various extracts of this organism, when administered orally, would protect rats against lethal doses administered subsequently. Extension of these experiments to man showed that oral immunization led to the formation of antibodies capable of producing a passive, type-specific protection in mice. In these cases the concentration of protective antibody formed was said to be generally such that one millilitre of serum would protect a mouse against 5000 lethal doses of pneumococci, which is within the range of the concentration others had reported for the serum of patients recovering from pneumonia. There was found to be no correlation between protection and the agglutinating titre of the serum concerned; in fact, Ross states that the agglutinins were not detected in these sera.

Previously I have found (unpublished) that lack of correlation between the agglutinating titres and protective power of sera is not confined to the oral method of immunization, nor to *Streptococcus pneumoniae*. The sera of mice immunized parenterally against *Haemophilus pertussis*, for example, vary considerably in these two properties, and it might reasonably be expected that protection and agglutination would correspond only when the antigen or antigens responsible for virulence and immunizing potency happened to be surface-somatic antigens. Moreover, there is little reason to suppose that, in the case of motile organisms, flagellar agglutinins would be concerned in any way with protection.

This may be important in assessing the results of certain other workers, who studied agglutinin curves only, as a measure of the success of oral immunization. Pijper and Dau (1930) studied "typhoid agglutination after oral immunization". The following is an extract from their paper:

In animals an increase in agglutinins after oral immunization was observed by Otten and Kirschner (1926) for dysentery, by Burke and La Verne Barnes (1926) for typhoid, by Englehardt and Kay (1927) for cholera, by Reiter (1926) for typhoid and dysentery and no increase by Kosmodemiansky (1928) for paratyphoid B. In man an increase was found by Gloukhoff, Sokolowa and Goremykina (1925) for cholera, a very small or no increase by Zoboli (1929), by Rosa (1928) and by Germino (1928) for typhoid and no increase by Englehardt and Kay (1927) for cholera.

Whether the type of agglutinin formed in the case of the *Salmonellas* was flagellar or somatic, or both, is not mentioned by these authors. However, with *Salmonella typhi*, it would not have been Vi agglutinin, which was not then recognized. Hoffstadt, Thompson and Martin (1929) found an increase in agglutinins in students after oral immunization, but here again the type of agglutinin was not stated. Besredka himself (1925, 1927), according to Pijper and Dau, denied the regular occurrence and the importance of serum antibodies after oral immunization.

Pijper and Dau in their experiments used heat-killed suspensions of *Salmonella typhi* "H" 901 and "O" 901 and an alcoholic suspension of "typhoid bacilli" from the Oxford Standards Laboratory. These were administered by Besredka's method—namely, the ingestion on three successive days of one pill containing dried bile, followed within twenty to thirty minutes by a pill containing about 40,000 million dried bacilli. Unfortunately, these records do not indicate clearly the virulence or the antigenic phase of their experimental organisms, except to state that the cultures used were those employed in routine diagnosis. However, the criterion of success in this case was not protection, but simply the development of homologous antibodies. They found that "O" antibodies alone were produced—the "H" antigens apparently not being absorbed from the gut in an antigenic form—reaching a maximum

titre in three weeks and traces remaining after twenty weeks. They state that from three to five weeks after oral immunization the titre may be so high as to interfere with proper serological diagnosis, if one, as is often the case, has to rely on "O" agglutination solely.

In view of Ross's claim that there is no correlation between the agglutinating and the protective titre of the serum following oral immunization, it is doubtful whether the work on typhoid, dysentery and cholera summarized above can be accepted one way or the other as evidence of protection by oral immunization. It is of particular interest to note the observations of Greenwood, Topley and Wilson (1931), who, in their studies on the effects of vaccination on herd mortality—using *Salmonella typhimurium* (*Bacterium aertrycke*) in mice—included a group immunized by the oral route. These workers make the following statement:

With regard to the other point at issue—the relative effectiveness of vaccination by the alimentary tract as compared with direct inoculation into the tissues—the results are quite clear cut, and are in accord with those of many other observers. It is obviously possible to produce a significant degree of active immunity by administering large doses of *Bact. aertrycke* vaccine by mouth although the route would appear to be slightly less effective than the intraperitoneal. There is no evidence that the immunity produced differs in kind from that produced by inoculation into the tissues. . . .

In summary, there is ample evidence that at least certain antigenic constituents of bacteria, including the polysaccharide capsule of pneumococci and the somatic antigens of *Vibrio cholerae* and of some species of *Salmonella* and the dysentery group, may be absorbed from the alimentary canal in a relatively unaltered condition, so that on their reaching the reticulo-endothelial depots antibodies are produced which are protective against the living organism and/or are detectable by in-vitro tests.

The purpose of these experiments was to ascertain the relative immunizing potency for mice of phase I *Hæmophilus pertussis* vaccine given by the parenteral and oral routes in equivalent doses, and in view of the findings of Greenwood *et alii* with *Salmonella typhimurium*, to compare large oral doses with small parenteral doses. For comparison with these mice, a proprietary dissolved oral vaccine was administered to mice orally and parenterally. As an indication of the likelihood that successful immunization may be achieved with a dissolved vaccine given by either route, the following is quoted from Lawson (1939), who refers here to the parenteral administration of pertussis vaccines.

The results obtained from commercial vaccines would indicate first that not all vaccines are now made from smooth organisms and that those not so made have little or no effect in producing immunity in the mouse; and second, that disruption of the intact bacterial cell so alters the antigen that it is a poor substitute for one composed of intact smooth organisms when used in attempted immunization of mice.

EXPERIMENTAL WORK.

Comparison of Subcutaneous and Oral Routes of Immunization in Mice.

The first step was a comparison in mice of equivalent subcutaneous and oral doses of phase I vaccine with dissolved oral vaccine.

The following vaccines were used: (i) twenty-four hour Bordet-Gengou (B-G) vaccine, 10,000 million organisms per millilitre (Gray, 1947); (ii) a proprietary dissolved oral vaccine, containing the dissolved antigens of 5000 million *Hæmophilus pertussis* organisms per millilitre.

The dose of *Hæmophilus pertussis* phase I vaccine selected for injection was that in use in other experiments in progress at the time (Gray, 1947)—namely, 1000 million organisms, that is, one-eightieth of the recommended dose for infants. As the dose of dissolved vaccine could not be selected in terms of numbers of bacterial cells, the equivalent number of dissolved *Hæmophilus pertussis* organisms according to the label was selected—that is, a total dose of 0.2 millilitre containing extracts of 1000 million organisms, representing one-eightieth of the dose recommended for

older children, or one-twentieth of the infant dose. This was considered to afford the dissolved vaccine some advantage over the phase I vaccine.

Parenteral Administration.

The total dose of 1000 million organisms was divided into three portions, each suspended in 0.25 millilitre of phenol saline solution. These were injected subcutaneously at intervals of seven days, and an interval of fourteen days was allowed to elapse between the last dose and the intranasal challenging dose of living organisms.

Oral Administration.

The same total dose of phase I vaccine as above was administered in five doses of 200 million organisms suspended in 0.02 millilitre of buffered broth. Five doses of dissolved oral vaccine were given in quantities of 0.04 millilitre. The doses were so spaced that they commenced and terminated at the same time as those in the parenteral group, and the challenging dose was given after a further lapse of fourteen days. Mice were found to drink the dose from a fine graduated pipette with no difficulty, provided water and food were withheld for eighteen hours prior to administration.

Challenging Dose.

The challenging dose selected was 50 million organisms from a twenty-four hour B-G culture. The intranasal method of Burnet and Timmins (1937), which has been employed in previous experiments (Gray 1946, 1947, 1948), was used here.

Results.

The arrangement and results of the test are set out in Table I.

In comparison with the phase I vaccine given parenterally, which affords approximately 80% protection against the challenging dose, the dissolved oral vaccine conferred no protection in terms of survivors at the twenty-first day. Therefore, oral vaccination with this preparation cannot be considered a satisfactory method for pertussis prophylaxis in mice.

The phase I vaccine administered orally afforded a significant, but much weaker, protection than did the same vaccine administered parenterally. Moreover, this protection was statistically better than that of the dissolved oral vaccine and among the untreated controls.

It is of interest to note that twenty-four-hour phase I vaccine, the most effective yet prepared, gave, by the oral route, approximately one-third of the protection it afforded by injection in identical dose. This result is in keeping with the observations of Greenwood *et alii* in experimental *Salmonella typhimurium* infection in mice.

Comparison of Intranasal and Oral Routes of Immunization in Mice.

In view of the previous successful differentiation of potency achieved by administering vaccines intranasally, this method was compared with the oral route in a somewhat larger experiment. Here, too, it was decided to determine the effect of greatly increased doses of phase I vaccine administered orally, for unless the degree of protection afforded by this method could be made to approximate very closely to that of the parenteral route, its practical usefulness would be negligible.

Included in the experiment was a group of mice to which the dissolved oral vaccine was given intranasally, to test the inference from Experiment I that this vaccine contains few if any pertussis antigens capable of stimulating protection.

Five groups of fifty mice were selected and treated as follows. (i) Group A (twenty-four-hour B-G vaccine): A total immunizing dose of 750,000,000 organisms was given intranasally under anaesthesia in two lots of 375,000,000 suspended in 0.075 millilitre volume, with an interval of seven days. (ii) Group B (twenty-four-hour B-G vaccine): A total dose of 15,000,000,000 organisms (that is twenty times the intranasal dose) was given orally in four doses over a period of seven days. (iii) Group C (dissolved oral

TABLE I.
Subcutaneous versus Oral Vaccination with Equivalent Doses.¹

Series.	Vaccine.	Route.	Death. (Time in Days.)	Survival.			Significance.
				Number of Survivors.	Average Time. (Days.)	Percentage.	
A	Twenty-four-hour B-G.	Subcutaneous.	2, 3, 4, 5, 13, 16.	24/30	19.0	80	v. B. $\chi^2=15.07xxx$ v. C. $\chi^2=36.74xxx$ v. D. $\chi^2=7.07xx$ v. E. —
B	Twenty-four-hour B-G.	Oral.	1, 2, 2, 2, 3, 3, 4, 4, 5, 5, 6, 6, 6, 7, 8, 9, 11, 12, 12, 13, 14.	8/30	10.5	27	—
C	"Dissolved Oral."	Oral.	1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 6, 6, 7, 8, 8, 9, 9, 10, 11, 14, 14, 14, 20.	0/30	5.7	0	—
D	Nil. (Control series.)	—	1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 5, 5, 8, 9, 9, 10, 10.	0/30	3.6	0	—

¹ Challenging dose after fourteen days: 50,000,000 twenty-four-hour B-G *Hemophilus pertussis* organisms given intranasally. Termination at twenty-first day. For averaging, survivors recorded as at twenty-two days. Analysis by Fisher's exact χ^2 method.

Interpretation: n.s. = not significant; x = significant at 5% level ($\chi^2 = 3.84$, one degree of freedom); xx = significant at 1% level ($\chi^2 = 6.64$, one degree of freedom); xxx = significant at 0.1% level ($\chi^2 = 10.83$, one degree of freedom).

vaccine): A total dose of 0.15 millilitre, equivalent in dissolved bacterial bodies to the dose in Group A, was given intranasally in two lots with an interval of seven days. (iv) Group D (dissolved oral vaccine): A total dose of 0.3 millilitre was given orally as in Group B. (v) Group E (untreated controls).

Three weeks after the last dose of vaccine all groups were challenged with a dose of 125,000,000 living phase I organisms from a twenty-four-hour B-G culture. The larger challenging dose compared with Experiment I was necessitated by the use of a new strain of mice, of which the resistance to intranasal infection with *Hemophilus pertussis* is high. The experiment was terminated on the eighth day and the results are summarized in Table II.

Reference to these results confirms the findings of Experiment I, but shows an appreciably higher (though not statistically significant) protection in the group given dissolved oral vaccine intranasally over the controls and over those receiving the same vaccine orally. The inference appears to be that protective antigens against pertussis infection in mice, although present in the dissolved vaccine in low concentration, give possibly a small degree of protection when given intranasally in comparison with phase I vaccine (with the number of mice used the degree of protection was not significantly superior to the controls) and completely fail to give protection when administered orally.

Perhaps the most significant result of this experiment was the failure of phase I vaccine to provide increased protection when given by the oral route even in a dose twenty times that administered by the intranasal route.

Comparison of Oral and Parenteral Routes on the Basis of the Development of Agglutinins and of Protective Antibodies.

In view of the results of the above experiments, another approach to the problem was adopted—namely, to examine the serum of rabbits immunized by both routes and of human volunteers after oral administration of the dissolved oral vaccine.

Rabbit Immunization.

After a preliminary test on their serum, rabbits were immunized parenterally and orally with twenty-four-hour B-G vaccine and with dissolved oral vaccine. Their sera were then examined for agglutinating and protective antibodies.

Parenteral Immunization.

Each rabbit received over a period of seven weeks a series of six doses of the appropriate vaccine, being equivalent, in cell numbers or dissolved bacterial bodies, to 50,000,000,000. The first dose was given subcutaneously and subsequent doses were given intravenously.

Oral Immunization.

Rabbits were immunized orally with phase I and dissolved vaccines. The same total dosage as in the previous experiment was divided into six lots administered from a graduated pipette into the mouth. Food and water were withheld on each occasion for twenty-four hours prior to being dosed, and the rabbits drank the liquid readily.

TABLE II.
Intranasal versus Oral Vaccination with Increased Oral Dose.¹

Series.	Vaccine.	Route.	Survival.		Significance.
			Number.	Percentage.	
A	Twenty-four-hour B-G.	Intranasal.	32/50	64	v. B. $\chi^2 = 7.84xx$ v. C. $\chi^2 = 11.63xxx$ v. D. $\chi^2 = 22.04xxx$ v. E. —
B	Twenty-four-hour B-G.	Oral.	17/50	34	v. C. $\chi^2 = <1.0$ (n.s.). v. D. $\chi^2 = 3.41$ (n.s.). v. E. $\chi^2 = 1.46$ (n.s.).
C	"Dissolved oral."	Intranasal	14/50	28	—
D	"Dissolved oral."	Oral.	8/50	16	—
E	Nil (control series).	—	8/50	16	—

¹ Challenging dose after twenty-one days: 125,000,000 twenty-four-hour B-G *Hemophilus pertussis* organisms given intranasally. Termination at eighth day. Analysis by Fisher's exact χ^2 method.

Interpretation: n.s. = not significant; x = significant at 5% level ($\chi^2 = 3.84$, one degree of freedom); xx = significant at 1% level ($\chi^2 = 6.64$, one degree of freedom); xxx = significant at 0.1% level ($\chi^2 = 10.83$, one degree of freedom).

TABLE III.
The Protective Values of "Oral" and "Parenteral" Sera from Rabbits given to Mice by the Intraperitoneal Route.¹

The Protective Value of Oral and Parenteral Sera from Rabbits Given Twice by the Intraperitoneal Route.							
Vaccine.	Route of Vaccination.	Serum.			Death. (Time in Days.)	Survivors.	
		Agglutination Titre.		Mouse Dose. (Millilitres.)		Number.	Average Time. (Days.)
		Pre-Inoculation.	At Three Weeks.				
Twenty-four-hour B-G (phase I)	Parenteral.	<1/5	1/5120	0.25	3, 3, 3, 6.	4/8	5.6
"Dissolved oral."	Oral.	<1/5	<1/5	0.25	2, 2, 2, 4, 5, 6, 7.	2/9	4.9
	Parenteral.	<1/5	<1/5	0.25	2, 2, 2, 2, 3, 3, 4.	1/8	3.2
	Oral.	<1/5	<1/5	0.25	2, 2, 2, 2, 2, 3.	2/8	3.6
Controls (Normal serum).	—	<1/5	<1/5	0.25	2, 2, 2, 2, 2, 4, 6, 6.	1/9	3.8

¹ Challenging dose: 100,000,000 twenty-four-hour B-G *Hæmophilus pertussis* organisms given intranasally. Termination: seven days. For averaging, survivors taken as at eight days.

Results.

All the animals were bled three weeks after the last dose and agglutinating and protective antibody titres were determined. Without further immunization, all rabbits were again bled nine weeks later and these tests were repeated.

Agglutination Tests.—Doubling dilutions of serum were put up in Dreyer tubes with an equal volume of a freshly prepared suspension of twenty-four-hour B-G cultured organisms, standardized by means of an Evelyn colorimeter (filter 660) to G = 60—that is, a little more dense than number 1 tube of the Wellcome opacity standards. Readings were taken after four hours in a water bath at 56° C. and checked after incubation for a further eighteen hours.

Protection Tests.—In the first experiment of this series (Table III) the sera were given to mice by intraperitoneal injection; this was followed four hours later by an intranasal challenge dose of 100,000,000 twenty-four-hour B-G organisms. As the contrast achieved here was not sufficiently clear cut, in the second experiment the sera were given intranasally after the manner recommended by North (1946), and were followed by a similar challenge dose twenty-four hours later.

Table III summarizes the first experiment.

This table has not been analysed statistically, for at best the small numbers of mice employed can merely show the general trend of the results. The degree of protection afforded and the average survival time with the phase I vaccine, given parenterally, appear higher than that afforded by the others, which are indistinguishable from each other and from the controls which received normal rabbit serum.

Table IV summarizes the second experiment, in which a smaller dose of serum was given by the intranasal route.

The results are of the same general nature as in Table III; but the difference between the survival rates of the twenty-four-hour B-G serum group and those of the others as a group is accentuated. It may be concluded that in rabbits, oral administration of either phase I or dissolved *Hæmophilus pertussis* vaccine fails to stimulate protective antibodies measurable by the routine serological and animal protection tests employed, and also that dissolved

oral vaccine given parenterally shows no evidence of antigenicity. It is of interest to note that the agglutinating titre of the phase I parenteral serum dropped from 1/5120 to 1/320 between experiments without any detectable loss of protective power. On the contrary, it appeared to improve, though the two experiments are not strictly comparable.

Human Oral Immunization with Dissolved Oral Vaccine.

The experiment to be reported covers only a small number of individuals and is included merely as further evidence in support of the general conclusions to be drawn from the other experiments.

The sera of three volunteers who took the prescribed course of the dissolved oral vaccine were compared with that of another who was naturally immune to pertussis, as the result of clinical infection, followed by prolonged laboratory contact with *Hæmophilus pertussis* phase I. Also included is a sample of rabbit serum from an actively immunized animal (twenty-four-hour B-G phase I vaccine).

The sera were examined before and after immunization by agglutination and protection tests, in the manner set out above, the intranasal route being used for administering the serum to mice. Blood was taken one month and two months after completion of the course of immunization. The results were sufficiently similar in each instance to restrict the results to one table (Table V).

DISCUSSION.

Several experiments have been carried out in an endeavour to determine whether oral immunization against *Hæmophilus pertussis* infection holds any possibilities of practical application to the control of this disease in man. The work centres mainly around a comparison of the relative efficiency in mice of the oral and parenteral routes of immunization with a phase I vaccine of established high potency; but I have included, for comparison, a proprietary dissolved oral vaccine dispensed for prophylactic and therapeutic control of whooping-cough.

It is obvious that the possibilities of absorption of bacterial antigens from the alimentary canal must be governed, amongst other things, by the chemical nature

TABLE IV.
The Protective Values of "Oral" and "Parenteral" Sera from Rabbits given to Mice by the Intranasal Route.¹

Vaccine.	Route of Vaccination.	Serum.		Death. (Time in Days.)	Survival.		
		Titre.	Mouse Dose. (Millilitres.)		Number.	Percentage.	Average Time. (Days.)
Twenty-four-hour B-G (phase I)	Parenteral. Oral. Parenteral. Oral.	1/320	0.075	2, 2, 3, 3, 3, 4, 5, 6.	12/20	60	6.2
"Dissolved oral."		<1/5	0.075	2, 2, 2, 2, 2, 2, 2, 2, 4, 4, 7.	3/15	20	3.3
		<1/5	0.075	1, 1, 2, 2, 2, 2, 2, 2, 3, 4, 4, 5.	2/15	13	3.2
		<1/5	0.075	2, 2, 2, 2, 2, 2, 2, 2, 4, 4, 6.	4/15	27	4.0
Controls (Normal serum).	—	<1/5	0.075	2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 4.	5/20	25	3.7

¹ Sera from the same animals as in Table III, bled nine weeks later. Challenging dose: 100,000,000 twenty-four-hour B-G *Hæmophilus pertussis* organisms given intranasally. Termination: seven days. For averaging, survivors taken as at eight days.

TABLE V.
Oral Immunization in Human Volunteers.¹

Serum.	Vaccine.	Route.	Agglutination Titre.		Natural Protection. (Number.)	Protection of Mice.		
			Natural.	Post Immunization.		Number.	Average Time (Days).	Percentage.
Rabbit 25	Phase I.	Intravenous.	<1/5	1/5120	1/10	20/24	7.5	88
D.G.	Nil (immune).	—	1/100	—	6/9	16/22	6.1	78
N.M.	"Dissolved oral."	Oral.	<1/5	<1/5	2/10	8/24	4.1	33
L.S.		Oral.	<1/5	<1/5	3/9	7/24	3.9	29
F.G.		Oral.	<1/5	<1/5	2/9	8/24	4.1	33
Control (Normal serum).	Nil.	—	<1/5	—	3/9	7/20	5.4	35

¹ Serum dose: 0.075 millilitre given intranasally. Challenging dose (twenty-four hours after administration of serum): 100,000,000 twenty-four hour B-G *Haemophilus pertussis* organisms given intranasally. Termination: seven days. For averaging, survivors taken as at eight days.

of the antigens, by the digestive peculiarities of the experimental animals employed, and by the physiological state of the bowel at the time of administration. In assessing the results of other workers in this field, it is perhaps as well to bear these points in mind. There appears to be little doubt that agglutinins may be formed against a variety of bacterial antigens following oral administration of vaccines. These include the polysaccharide capsule of at least some types of *Streptococcus pneumoniae* and the somatic antigens of *Vibrio cholerae* and of some species of *Salmonella* and *Shigella*. Whether or not these agglutinins will be protective against infection with the corresponding organisms will naturally depend on their relative importance in the antigenic mosaic of the organism concerned. There is a good deal of evidence, for example, that the pneumococcal polysaccharides and the somatic antigens of the *Salmonellas* are intimately concerned with virulence and with immunizing potency, and this may explain the success claimed respectively by Ross and by Greenwood and his colleagues for oral immunization with these organisms. It seems justifiable, then, to assume that no generally applicable rule is possible with regard to the anticipated outcome of oral administration of vaccines.

The results of our experiments, although they offer little hope of successful oral immunization against pertussis infection, are interesting from the more academic viewpoint.

It has been found that phase I vaccine given to mice by mouth on an empty stomach stimulates a significant degree of protection (27%) compared with non-immune controls (nil). However, the degree of protection afforded is very much lower than when the same total dose of vaccine is given parenterally (80%). An attempt to increase the protection by the oral route with a twenty-fold increase in dose failed to improve the protection significantly.

The proprietary dissolved oral vaccine administered by the oral route in mice failed to produce any protection, from which it was concluded either that this vaccine was not assimilable in an unchanged form or that it contained no antigens capable of stimulating immunity in mice. When administered parenterally to mice, this vaccine was slightly, though not significantly, superior to the unprotected controls, and slightly, though not significantly, inferior to the phase I oral group. This suggests that its antigenic activity is of a low order.

Another method of approaching this problem was to immunize rabbits orally and parenterally with both vaccines. Agglutination tests on their serum before immunization, and at different intervals after immunization, showed that measurable agglutinins in the rabbit for twenty-four-hour phase I suspensions were developed only after the parenteral injection of phase I vaccine. A similar interpretation is placed on the results of passive protection tests on mice with these sera. In other words, the dissolved vaccine was inactive in rabbits when given either orally or parenterally; while the phase I vaccine was inactive orally, though fully active parenterally. Finally, a small experiment was planned to test the efficacy of the oral vaccine in human volunteers. Although the

numbers used are small, the results confirm the conclusions from the previous tests—namely, that the dissolved oral vaccine is virtually non-antigenic for mice, rabbits or man.

SUMMARY AND CONCLUSIONS.

1. Twenty-four-hour B-G cultured phase I vaccine is highly protective for mice when given by the parenteral route, and stimulates the formation of protective antibodies and agglutinins against phase I *Haemophilus pertussis* in rabbits. This confirms previous findings.

2. This vaccine, when given orally to mice, stimulates a lower but significant degree of protection, which apparently cannot be greatly improved with even twenty-fold doses given by this route. However, oral administration to rabbits did not stimulate the formation of agglutinins or protective antibodies.

3. A proprietary dissolved oral vaccine failed to produce significant immunity in mice when given by the oral or parenteral route under the experimental conditions employed. It also failed to stimulate protective antibodies or agglutinins when given by either route in rabbits or by the oral route in human volunteers.

4. There is nothing in these results to suggest that effective oral immunization against pertussis infection is likely to be achieved with any of the existing vaccines.

ACKNOWLEDGEMENT.

I am indebted to Mr. R. T. Leslie, M.Sc., for the analyses.

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AN EPIDEMIC OF ACUTE LARYNGO-TRACHEO-BRONCHITIS IN TOOWOOMBA.

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ACUTE LARYNGO-TRACHEO-BRONCHITIS occurs epidemically in Toowoomba at irregular intervals, and in previous epidemics the mortality rate has been unpleasantly high. It is a terrifying disease for the patient, for the patient's relatives and for the medical attendant.

I understand that in the last epidemic, which occurred a few years ago, five patients were admitted to the Toowoomba General Hospital, all of whom died. On three of these patients tracheotomy was performed.

In previous reports (Arden and Duhig, 1944), acute laryngo-tracheo-bronchitis has had a mortality rate as high as 51.3%, and never lower than 25%.

The Recent Epidemic.

In the recent epidemic, which now appears to have run its course, 24 patients suffering from acute laryngo-tracheo-bronchitis were admitted to the Toowoomba General Hospital between May 19, 1949, and the time of preparation of this paper (July 22, 1949).

During the same period of time, 25 patients suffering from croupous laryngitis were admitted to the hospital. Croupous laryngitis is an early stage and milder form of the same disease process, and it is somewhat difficult to set a dividing line between the two.

For the purpose of this article, the term "acute laryngo-tracheo-bronchitis" is reserved for those cases in which severe respiratory embarrassment is present, as evidenced by epigastric, intercostal and supraclavicular inspiratory recession.

Age Incidence.

The age group most heavily affected is that between one and three years, very few cases being encountered outside these limits, and none over the age of six years.

History Prior to Admission to Hospital.

The usual story is that a baby, previously healthy, has had a cold for the two or three days prior to admission to hospital, and that a cough developed within twenty-four hours or so, which a few hours later became "croupy". Then, a few hours prior to admission to hospital, "that awful breathing" had started.

Clinical Picture on Admission to Hospital.

Naturally enough, the patients presented varying grades of severity of the disease when first encountered. Those who presented the picture of croupous laryngitis were of good colour or slightly flushed, breathing easily, and occasionally giving vent to the aforementioned dry, croupy cough. The temperature ranged between 99° and 101° F.; tachycardia was usually present (120 to 140 beats per minute).

In many of these patients the picture of acute laryngo-tracheo-bronchitis developed, usually within three or four hours of admission to hospital. When this occurred, it did so with alarming suddenness. Literally within the space of minutes, from being a relatively mild disease the condition would become one of the utmost gravity.

The child would then be either extremely pale or a leaden grey in colour. These patients were not cyanosed, even up to the point of death. The breathing was rapid and laboured, with pronounced indrawing of the lower end of the sternum, and strenuous play of the accessory muscles of respiration. Inspiratory and expiratory stridor was present. This stridor was high-pitched and even, on occasions, of a whistling character. The temperature ranged between 99° and 105° F., and the pulse rate was in the region of 160 per minute or more. Several patients

were comatose, with half-closed lids and dilated pupils. Those who retained consciousness would restlessly move about in an attempt to ease their distress: propping themselves up, rolling over onto all fours, and then falling back into the prone position. They presented a picture of the most extreme anguish.

The fauces were but mildly inflamed, and no membrane was visible on the tonsils or pharyngeal mucosa.

Results of Throat Swabbings.

Interesting results were obtained from the examination of throat swabbings. In a very few cases no organisms were isolated on culture. In one instance *Neisseria catarrhalis* alone was isolated. In the remainder two organisms were present, and one of these was always *Neisseria catarrhalis*. The second organism, in the majority, was either a hemolytic streptococcus or *Streptococcus viridans*, and in the few remaining cases the second organism was the *Staphylococcus aureus*.

Corynebacterium diphtheriae was not isolated in any case.

Treatment Used in the Early Cases.

The following two histories illustrate the treatment used in the early cases.

The first patient, M.C., a girl, aged two years and nine months, was admitted to hospital a fortnight prior to the others, at 2.15 p.m. She showed extreme respiratory distress with pronounced sternal indrawing, and stridor. The skin was pale. The pulse rate was 130 per minute. She was nursed in a steam tent, and given 100,000 units of penicillin intramuscularly on her admission to hospital. Every five minutes the mouthpiece of an atomizer containing penicillin solution, 2000 units per millilitre, was placed between the child's lips, and a spray directed down the throat with each inspiration. At 3.30 p.m. the pulse rate suddenly dropped from 150 per minute to 60 per minute, and the patient was comatose and in a state of collapse. Adrenaline (three minims) was administered hypodermically, and the continuous intranasal administration of oxygen was commenced. A few minutes later the child's cheeks were pink. At 4 p.m. the pulse rate was again 134 per minute. The patient regained consciousness at about 5 p.m., but lapsed again into coma at 8 p.m. Penicillin, 50,000 units, was administered at 5.30 p.m. and again at 8.30 p.m. The patient's condition remained the same from this time until 11.35 p.m., when without warning respiration and heart action ceased almost simultaneously.

The second patient, R.W., a boy, aged two and a half years, was admitted to hospital at 10.30 a.m. He presented the same clinical picture. He also was nursed under steam, and in addition to the intramuscular administration of penicillin and the intranasal administration of oxygen, "Sulphadital" was given by mouth. His condition remained unaltered until 4 p.m., when he lapsed into coma. At 4.30 p.m. respiration ceased and no heart beat could be heard.

Autopsies were not performed on the bodies of these two children.

In view of the respiratory distress, one's natural first impulse is to consider the advisability of performing tracheotomy. My seniors, however, who had had experience of the disease in previous epidemics, considered that this procedure hastened the inevitable end, it being assumed, in view of the children's colour and the mode of death, that death was due to fulminating toxæmia.

The Treatment Subsequently Adopted.

As four other children with the disease were admitted to hospital on the same day as the second patient (including this patient's two sisters), it was decided to review drastically the plan of treatment.

The following treatment was thenceforward applied to all patients as a routine measure—not only to those with acute laryngo-tracheo-bronchitis, but also prophylactically to those with croupous laryngitis, as there seems to be no way of foretelling which patients will develop the more serious form of the disease: (i) All were nursed in steam tents. (ii) Oxygen was administered continuously by the nose. (iii) On the patient's admission to hospital a soap and water enema was given, followed by a bowel wash-

out with a light pink solution of potassium permanganate. (This apparently in some way relieves the cerebral anoxæmia, and I believe that it was employed with some measure of success in the treatment of pneumonia before the advent of penicillin and the sulphonamides.) (iv) An initial intramuscular injection of one gramme of sodium sulphadiazine was administered. (v) "Sulphadital" was given by mouth every four hours. The actual dose varied according to the age and the severity of the condition, and if necessary full adult doses were given to all patients three years of age or over. (vi) Alkali was given concurrently with the "Sulphadital". (vii) The patient was induced to drink as much fluid as possible. Intravenous therapy was not employed. (viii) Penicillin was administered every three hours by intramuscular injection. The dosage ranged between 5000 units and 50,000 units every three hours, depending on the severity of the disease. (ix) Streptomycin was administered intramuscularly, the usual dose being 0.25 gramme twice a day. (x) Ascorbic acid (25 milligrammes every six hours) was given by mouth.

The Results from this Treatment.—This indeed was "shot-gun" therapy with a vengeance, and perhaps unscientific. It had, however, one very good argument in its favour: it was 100% successful. This remark applies to 21 cases of severe acute laryngo-tracheo-bronchitis. Under this vigorous regime all patients showed improvement within twenty-four hours, and were out of danger in thirty-six hours. The respiratory distress was relieved, and the temperature and pulse rate returned to normal. All patients were discharged from hospital within ten days (the majority inside a week), and the mothers were instructed to keep them in bed, at home, for a further week. So far no unfavourable sequelæ have been observed from this epidemic. One child was readmitted to hospital sixteen days after discharge with the same disease, and recovered a second time.

One Case Complicated by Pneumonia.

On June 30 a patient was admitted to hospital who presented interesting and unusual features.

This patient, D.M., a boy, aged three years, was admitted to the Toowoomba General Hospital at 10 a.m. from an outlying town. A tracheotomy had been performed the previous night. On his admission to hospital the child was comatose, and presented all the most severe features of the disease. The breathing was rapid (65 per minute) and most laboured, with pronounced sternal and intercostal recession. The pulse rate was over 160 per minute, and the temperature 103° F. This patient's lips and cheeks were cyanosed. Breathing was still possible when the opening of the tracheotomy tube was occluded for a few seconds.

The above-described regime of treatment was instituted without delay.

Progress was stationary until 3 p.m., when the temperature began to rise sharply. At 4 p.m. it was 108.6° F. The steam supply into the tent was shut off, and by tepid sponging the temperature was reduced to 106° F.

At 4.30 p.m. the respirations ceased suddenly, and no heart sounds were audible. A needle was immediately inserted into the fourth left intercostal space until blood was aspirated back into the syringe, and five millilitres of 1:1000 adrenaline were injected. (The blood aspirated was dark, but by no means so dark as that sometimes seen during the course of an unskillfully administered anæsthetic.) A small amount of gelatinous exudate was aspirated from the trachea via the tracheotomy tube, by means of a fine catheter. Artificial respiration was commenced.

Some thirty seconds later respirations recommenced, albeit reluctantly, and the patient was kept alive until 6 p.m.

At autopsy, no laryngeal obstruction was found. Commencing just above the bifurcation of the trachea, and extending down through both bronchial trees, was a thick, yellowish-red, tenacious exudate. Very little exudate was present in the finer branches of the bronchi. Bilateral apical pneumonia in the stage of red hepatization was present. The heart appeared normal to the naked eye, and congestive changes only were seen in it on microscopic examination.

In view of the time intervals involved, it is unlikely that the pneumonia was a complication of tracheotomy. It seems probable that the presence of pneumonia accounted for the cyanosis in this case, and was in large part responsible for death.

On the previous evening this patient must have presented the picture of a cyanosed child struggling for breath, and there are few who would not have performed tracheotomy under such circumstances.

Comment.

The Ætiology.

On the question of ætiology one can only speculate. The variety of organisms discovered is confusing, and seems to suggest that the infective agent is primarily a virus (causing croupous laryngitis), the pyogens being secondary and accounting for the more serious form of the disease (that is, acute laryngo-tracheo-bronchitis). Two facts seem to support this view: (i) acute laryngo-tracheo-bronchitis responds satisfactorily to intensive chemotherapy; (ii) many of the nurses attending these patients developed coryza with a mild form of croupous laryngitis, and no organisms were isolated from throat swabbings.

The Cause of Death.

There has been much difference of opinion as to whether death in acute laryngo-tracheo-bronchitis is due to respiratory obstruction or to toxæmia.

One cannot argue with the fact that a very severe degree of respiratory obstruction is present.

There must also be severe toxæmia, which for three reasons seems to me to be the essential factor in causing death: (i) These patients continue to live for hours despite the same severe degree of unchanging respiratory distress, and then die suddenly with almost no warning of impending dissolution. (ii) If this was a type of *asphyxia pallida*, the blood must of necessity be a dark blue or black (it being a type of asphyxia)—and in the patient D.M. it was by no means so dark as one would expect in a patient dying from asphyxia, despite the complicating pneumonia. (iii) The pallor in these cases, whether associated with asphyxia or not, is almost certainly due to failure of the left side of the heart, and in the patient M.C. heart block was present at one stage—very strong evidence in favour of toxæmic myocarditis.

The respiratory obstruction in acute laryngo-tracheo-bronchitis, moreover, is not an obstruction that can be relieved by tracheotomy, for it is an obstruction of the whole respiratory tree. I have no personal experience of tracheotomy followed by repeated clearing of the trachea by suction and other mechanical means, but it appears to be a most gruelling procedure that must severely strain an already weak and overburdened heart.

The correct answer is probably that two factors—(a) deficient oxygenation of the blood due to respiratory obstruction, and (b) the more important, toxæmic myocardial failure—together cause anoxæmia of the medullary centres, and that this latter is the ultimate cause of a fatal issue.

If this is so, then the rational procedure would be to destroy the organisms producing the toxæmia. This rationale seems to have been justified in the epidemic which is the subject of this paper.

Conclusions.

From observation of this epidemic, there are three important conclusions to be drawn:

1. In the early stages of the disease there is no way of telling which cases are going to become serious; and therefore it seems rational to keep all patients examined under close observation, if not in hospital.

2. Acute laryngo-tracheo-bronchitis closely resembles laryngeal diphtheria, and both diseases should be borne in mind when one is presented with this clinical picture.

3. The regime of treatment described above seems to be successful in coping with even the most severe instances of the disease, without resort to surgery.

Acknowledgements.

I am indebted to Dr. James Bell, medical superintendent of the Toowoomba General Hospital, for describing to me details of the clinical progress of the patient, M.C., during my absence from the ward; to Dr. F. Trener (Public Health Laboratory, Toowoomba) for pathological reports, and for acquainting me with previous literature on this subject; and to the Toowoomba Hospitals Board for access to hospital records.

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Reports of Cases.

AGENESIS OF THE LUNG.

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AGENESIS of the lung is rare, less than 50 cases having been reported. A case occurring in a premature baby at the Women's Hospital, Melbourne, is thought worthy of record.

Clinical Record.

Mrs. D., aged thirty-five years, was admitted to the Women's Hospital, Melbourne, on December 25, 1946. She was a healthy woman, weighed 75 kilograms and had a normal child, aged nineteen years. She had had a miscarriage ten years earlier and was now for the third time pregnant.

She had attended the ante-natal clinic and was due for delivery on February 3, 1947. She gave a history of measles and appendicectomy eleven years earlier, but otherwise had been perfectly well. Shortly before her admission to hospital she developed hydramnios. Labour commenced at 7 p.m. on December 25, 1946, and an apparently normal premature male baby was born at 1.15 a.m. on December 26. The baby was difficult to resuscitate and remained cyanosed and dyspnoeic. It died at 2 a.m. on December 26.

Post-Mortem Examination.

At autopsy the body was that of a normally developed premature male baby 1800 grammes in weight. The thorax was well formed and of normal contour. When the anterior chest wall was removed the heart was seen to be displaced to the right side almost to the lateral wall. Fibrous adhesions bound the pericardium and chest wall. An enlarged thymus was pushed over to the right. No pleural cavity or lung on the right side was seen.

The left lung was very enlarged. An imperfect shallow fissure was grooving the anterior surface in the usual position of the interlobar septum, but this did not extend on to the posterior aspect. The lung overspread the heart anteriorly, extending across the mid-line to some extent.

When the pericardium was opened the heart and great vessels were found to be normal in size, shape and position. The pulmonary artery gave a normal left branch to the left lung and the *ductus arteriosus* was wide and patent. The left pulmonary veins entered the left auricle in the normal fashion. On detailed dissection a very small right pulmonary artery was seen. This extended to the hilar region of a small, flattened disk of tissue about two centimetres in diameter in the posterior mediastinum behind the heart, representing the right lung.

The trachea appeared unusually long. The upper portion and larynx were normal, but the lower portion appeared directly continuous with the left bronchus. A narrow right bronchus originated rather low down and passed to the rudimentary right lung.

The examination of the other organs revealed no significant features.

Details of the Structure of the Lungs.

The rudimentary right lung consisted of a flat disk of firm tissue about two centimetres in diameter. It was well encapsulated and demarcated from the loose areolar tissue of the posterior mediastinum. Examination of sections revealed a delicate capsule and soft crepitant lung parenchyma of normal appearance. On the medial surface towards the upper pole was a well demarcated hilum where entered the small right bronchus and pulmonary artery. Right pulmonary veins were not found.

On microscopic examination there appeared to be some increase in the interlobular fibrous tissue. The bronchioles were collapsed, the epithelial lining often being thrown into folds; the walls were not normally developed and often consisted only of a narrow fibrous tissue layer without any muscle. Sometimes, however, a thin muscular layer was present. Occasionally the walls contained quite large plaques of cartilage, yet the muscle layer was absent. The alveoli were all well expanded and showed the normal flattened epithelial lining. There was no evidence of any residual atelectasis.

The left lung appeared larger than normal. It was of normal shape and fairly well expanded. However, very imperfect lobulation was present. The interlobular sulcus was present on the anterior surface, but was very shallow and gradually faded out on the lateral surface. There was no sulcus on the posterior surface. Examination of sections showed the pleura to be delicate and the parenchyma crepitant and even throughout. In the lower lobe, however, numerous tiny cystic cavities were seen scattered through the substance.

Microscopic examination revealed little if any increased fibrous tissue. The bronchioles were all wide and lined by normal columnar epithelium. Some had plaques of cartilage and a thin muscle layer in the wall. The small cystic cavities were lined by columnar epithelium with a thin layer of fibrous tissue beneath; no muscle fibres were demonstrable. These were probably cystically dilated bronchioles. The alveoli were air-containing, often over-distended, but of normal structure.

Comment.

The case was regarded as one of extreme hypoplasia of the right lung together with an early stage of development of congenital cysts in the left lung.

Discussion.

In the elucidation of any clinical syndrome, investigation seems always to have followed definite lines.

A first phase of pure clinical observation is followed by a second phase of detailed anatomical studies. In the third phase correlation of clinical and anatomical features leads to an integration of a biological entity.

Extensive work in morbid anatomy suggested, in the case of agenesis of the lung, a tentative classification. Schneider (1912) grouped the morbid findings under three headings. (Apart from Schmidt's case, quoted by him, of complete absence of the trachea and both lungs in a still-born foetus, the lung was absent in all cases on one side only.) Schneider's groups are as follows: (a) The bronchus and lung tissue are completely absent on one side. The trachea is directly continuous with the main bronchus of the single lung. (b) The bronchus of the absent lung is represented by a small out-pocketing from the trachea; surrounding mucous glands may be present but no true lung tissue. (c) Extreme hypoplasia of one lung may be present rather than aplasia. The bronchus is formed, but reduced in size, and enters the lung, a small, fleshy structure lying in the posterior mediastinum.

Of these three groups the third is much the rarest. This condition of an extremely hypoplastic lung present in the posterior mediastinum has been reported only on two or three occasions. To this rare group the present case belongs.

The lung has apparently functioned to some extent as judged by the presence of a narrow but patent bronchus

and a small pulmonary artery. On the other hand, proper growth and development of this "lung Anlage" would be unlikely if the child had lived. Yampolsky *et alii* (1938) have described such a case in a child, aged two years, who died of pneumonia. Autopsy revealed a hypoplastic disk of lung tissue (12 grammes) representing a rudimentary right lung.

Hurwitz and Stephens (1937) summarized the literature of the condition when reporting a case of their own. They stated that it had occurred in 34 adequately recorded cases: three subjects were still-born, four subjects were aged under one week, 12 were aged under six months, one was aged under five years and 14 were aged from five to seventy-two years. Hurwitz and Stephens's patient, aged seventy-two years, had died from a cerebral hæmorrhage and had never manifested signs of lung malformation, the condition being accidentally discovered at autopsy. Of 31 subjects 18 were males, and in the 34 cases the left lung was absent in 22.

Clinically the condition may not give rise to symptoms. On the other hand, in infants there may be stertorous breathing or recurrent attacks of dyspnoea and even cyanosis.

In older children, inspection of the chest usually reveals a normal appearance, but there may be some flattening of the affected side and slight scoliosis. Routine examination for recurrent slight colds or pneumonia may lead to the discovery of the condition. There is often an association with other congenital anomalies; cases are reported associated with a poorly developed remaining lung, narrowing of the trachea or bronchi with supernumerary cartilaginous rings, stenosis of the oesophagus, *atresia ani*, absence of the diaphragm, hypoplasia of the face, dermoid of the eye, absence of the pleura, agenesis of the spleen, left kidney and ureter, or absence of radius or one hand.

Since then cases have been reported from time to time (Yampolsky *et alii*, 1938; Madigan, 1941; Stokes and Brown, 1940; Bowden, 1947; Killingsworth and Hibbs, 1939; Deweese and Howard, 1944).

Jordan (1939) has given a classification of developmental anomalies of the respiratory system. Gruenfeld and Gray (1941) and Killingsworth and Hibbs (1939) have given admirable summaries. Van Loon and Diamond (1941) reported the case of a girl, aged three and a half years, who had recurring mild chest complaints. In the routine examination of the chest the trachea and heart were found to be pushed over to the right and the lung on the right side was considered to be atelectatic. On bronchoscopic examination no right bronchus could be seen, and visualization by lipiodol instillation into the bronchial tree confirmed the absence of the lung on the right side.

Ferguson and Neuhauser (1944) have discovered five cases over the past six years. All these cases were diagnosed by bronchoscopic examination during life. There were usually some flattening and poor excursion of the affected side of the chest, but no obvious symptoms. They state that the condition has been erroneously diagnosed as pneumonia, massive atelectasis, foreign body in a bronchus, hydrothorax, diaphragmatic hernia or diaphragmatic paralysis, and that the cases were mostly discovered by routine chest examination of children admitted to hospital for other conditions.

The plain X-ray film generally shows a homogeneous shadow on the affected side, with displacement of the heart and mediastinum, elevation of the diaphragm and narrowing of the intercostal spaces on this side. Bronchoscopy and injection of lipiodol give more positive evidence.

In one of the cases recorded by Ferguson and Neuhauser, a female infant, aged four months, had had respiratory embarrassment from birth; bronchoscopic examination was followed by pneumonia and death. Autopsy revealed absence of the right lung.

In symptomless cases the remaining lung had apparently undergone a compensatory growth, and the muscles on the functioning side also were over developed. These children were living normal lives unaware of any "shortness of wind" or other handicap.

The prognosis should be guarded, as there may be associated congenital anomalies which in themselves may be serious; also an otherwise insignificant involvement of the only existing lung, whether from infection, foreign body or trauma, may be fatal.

Garber (1945), in following up this work, reported a case in a child (age not stated) with a history of recurrent upper respiratory infections and contact with a tuberculous aunt. The bronchogram revealed absence of the left lung and a small pouch from the trachea representing the left bronchus. This patient was followed for over seven years, and despite an attack of pneumonia, managed fairly well.

Smart (1946) described two cases in young adult women. In one case, an unmarried woman, aged thirty years, had suffered from asthma since childhood. The condition was discovered by physical examination of the chest to determine the question of her fitness for an anæsthetic for an operation for dysmenorrhœa. The second patient was a married woman, aged twenty-nine years. She had also suffered all her life from asthmatical attacks associated with dyspnoea. Both these patients had a bronchoscopic examination and lipiodol injection into the trachea, which confirmed the non-development of one lung. In the second case this was associated with a much narrowed trachea. The investigator showed by spirometric readings and measurement of intrapleural pressure that hypertrophy and not emphysema of the remaining lung had occurred. He stated that the three cardinal clinical features were as follows: (i) asymmetrical chest with equal or approximately equal movements; (ii) gross displacement of the trachea to one side; (iii) displacement and rotation of the contents of the mediastinum, the breath sounds being usually audible over the whole chest.

Summary.

1. A case of agenesis of the right lung is described, belonging to the rarest of Schneider's three groups and representing an extreme hypoplasia rather than aplasia.
2. A brief view of the literature is attempted.
3. It is suggested that the diagnosis of agenesis of the lung can be made by endoscopic methods.
4. It is shown from the literature that in many cases the subject seems not unduly handicapped in life and can take his place as a normal member of society.

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Reviews.

PSYCHOLOGICAL PROBLEMS IN CLINICAL MEDICINE.

In "Psychological Aspects of Clinical Medicine" Dr. Barton Hall has indicated the methods of approach to psychological problems from the standpoint of general medicine.¹ Perhaps the most valuable contribution which he has made to this subject is his description, based on a wide experience in private and out-patient practice, of the ways in which he handles the patients who are referred to him. The work deals with methods rather than with the factual material which makes some text-books of psychiatry, however valuable they may be for examinations, less helpful as regards the investigation and personal handling of patients.

In the chapter on the application of psychometry to medicine, Dr. Barton Hall has surveyed the tests in common use for the estimation of intelligence and special aptitudes, without attempting to describe the various techniques which indeed the beginner in psychiatry can hardly learn from books. We are glad to read that Dr. Barton Hall believes that the "test of life", that is, the psychiatric history or biography of the patient, provides the most reliable index of temperament.

The short section on emotional development is disappointing in that it comprises a condensation of Freudian theory. A more behaviouristic description indicating the landmarks in the child's progress to maturity would have been more in keeping with the general purpose of the book. The emotional relationships of disordered function of the gastro-intestinal tract, skin reactions, asthma and various other somatic expressions of emotional tension are reviewed with helpful examples from case records.

A chapter is devoted to personality disorders including psychopathic personality, and the mental symptoms and complications of organic diseases of the nervous system also receive full attention. Each chapter ends with a full list of references.

The treatments described are such as can be carried out by the general physician, but adequate reference is made to the indications for specialized techniques which lie within the province of the psychiatrist and neurosurgeon.

Both the physician, who is feeling his way into the psychology of his patients, and the psychiatrist, who is called upon to disentangle a psychosomatic symptom-complex, will find something of value in this book, which can be recommended also to the senior student who is prepared to look beyond morbid anatomy to personality and social influences.

SHOCK.

THE present-day knowledge of "Shock and Allied Forms of Failure of the Circulation" is well presented by Dr. H. A. Davis in his new book,² which will be of value to the surgeon, the physician and the pathologist.

In such a book it is necessary to define "shock", and this is a matter of some difficulty. The definition given is "shock is a state involving the entire organism, characterized by a generalized impairment of the circulation, and caused by any form of stress or injury which reduces the output of blood from the left ventricle of the heart to a level below that needed for normal cellular function and metabolism".

Although many of the problems relating to shock and allied states are still unsolved, various interesting and

provocative suggestions are made in this book. The existence is recognized of the "toxic syndrome" after burns, a condition which seems to be denied by some authors or attributed to infection by others. While there is no convincing proof that a toxin absorbed from the burnt area is the cause of the circulatory failure, the tachycardia, the hyperpyrexia, the delirium and death which occurs four to six days after extensive burns, the existence of such a toxin would seem to be more likely than the suggestion of Davis that this syndrome is due to an acute vitamin B₁ deficiency.

The main advances in recent years in the treatment of shock have been the recognition of the value of large transfusions of blood and the recognition of the disadvantages of overheating the shocked patient; and these have been stressed throughout this book.

Pressor substances as a whole are condemned for use in traumatic and hæmorrhagic shock, and no mention is made of adrenaline as a pressor substance for such use. Even if it is believed that adrenaline is useless or even harmful, it is worthy of discussion in this regard, for repeated attempts have been made to introduce adrenaline by continuous intravenous injection for the treatment of post-operative shock.

The term "circulatory weakening" is well chosen for describing the patient "whose circulatory response to the stress of everyday living is adequate, but who, when subjected to unusual strain such as occurs during surgical operations, blood loss, anaesthesia, severe infections and other types of stress, exhibits a capacity far below the norm to maintain an adequate circulation and who, therefore, succumbs more readily to failure of the circulation".

The importance of the clinical assessment of the patient is emphasized, and it is realized that it is not possible to treat a shocked patient purely on the results obtained by laboratory examinations. This is especially so in patients who are examined immediately after extensive injuries of the soft tissues. The blood pressure may then be normal or even slightly raised, and there may be a slowing of the pulse rate. The blood pressure is maintained by vasoconstriction and this may be of such a degree that the radial pulse is not palpable. Surgeons concerned with the immediate treatment of war casualties are very much aware of this occasional and temporary hypertension and bradycardia.

The subject of shock and allied states is completely covered from all aspects, and there is an extensive list of references with each chapter. There are few typographical errors, but one which is noticeable is the first date on page 1. The length of the book may be criticized, but not if it is to be regarded mainly as a reference book.

THE PRINCIPLES OF CHIROPODY.

THE "Principles of Chiroprody" by John H. Hanby and H. E. Walker originates in the home of chiropractical teaching in Great Britain, namely, the London Foot Hospital.¹ Mr. Norman Lake in a foreword states that the authors have had an exceptionally long and great experience of the requirements of students. The senior author was one of the original students at the establishment of the school and has been associated with it in many capacities ever since. The authors have succeeded in their aim to provide a clear account of the background upon which chiroprody is based and a statement of the ideas along which modern chiroprody is developing.

The concept of the structure and function of the foot is based on the writings of Wood Jones, Lake and D. J. Morton. The treatment of conditions which come within the sphere of the chiropractist is sound. It is pleasing to read that now the use of the knife is only incidental, and interest is not confined to the painful effects of minor lesions of the foot, but to the reasons why conditions such as these should occur at all.

The use of adhesive padding on the foot is advocated as opposed to correction by the shoe. It is agreed that in general the patient is most benefited by shoe adjustments when the tarsus is in need of alignment. The authors state: "Shoe adjustments have little influence over discomfort in the forefoot." Although "Diseases of the Foot" by E. O. Hauser is listed in the bibliography, apparently the authors are not acquainted with complete relief obtained

¹ "Psychological Aspects of Clinical Medicine", by Stephen Barton Hall, M.D., D.P.M.; 1949. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 432, with six illustrations. Price: 21s.

² "Shock and Allied Forms of Failure of the Circulation", by H. A. Davis, M.D., C.M., F.A.C.S.; 1949. New York: Grune and Stratton. 9" x 5½", pp. 612, with 55 illustrations. Price: \$12.00.

¹ "The Principles of Chiroprody", by John H. Hanby, F.Ch.S., and H. E. Walker, F.Ch.S., with a foreword by Norman C. Lake, M.D., M.S., D.Sc. (London), F.R.C.S. (England); 1949. London: Baillière, Tindall and Cox. 8½" x 5½", pp. 396, with 129 illustrations. Price: 21s.

by the use of Hauser metatarsal bars in the treatment of most types of forefoot strain.

The obvious disadvantage of chiropodial padding is that frequent visits to a chiropodist are required. In this country many patients with forefoot collapse are unrelieved by foot padding alone. Foot padding should be supplementary to correction of foot disabilities by the shoe. There is an interesting chapter on examination of the shoe for indication of the many varieties of footstrain.

The book is well illustrated and covers anatomy and physiology, diagnosis, methods of treatment and specific affections of the foot and their treatment.

We recommend this book to students of chiropody and to practising chiropodists. Nurses and physiotherapists would find it interesting and educational. Many chapters could be read with benefit by medical practitioners and they would then be in a better position to advise their patients.

THE RHESUS FACTOR.

A SECOND EDITION of "The Rhesus Factor" by G. Fulton Roberts has just appeared.¹ First published in 1947, this book was commended, in a previous review, as a good "digest" of the immense volume of literature evoked by the discovery of the Rh factor. The second edition has been revised and enlarged to 63 pages instead of 46; new chapters on recent advances and on laboratory technique have been added. It is still little more than a pamphlet, but contains much useful information in a small compass. The style is somewhat colloquial and in places precision is sacrificed to simplicity. Some minor faults noted in the first edition have been corrected. The opening sentence, however, is still inaccurate; the rhesus factor was discovered by Landsteiner and Wiener in 1940, not in 1939. Again, on page 3, it is stated that "in 1939 Levine and Stetson published a case report which demonstrated the rhesus antibody for the first time". The truth is that Levine and Stetson in 1939 demonstrated an instance of iso-immunization by the *fetus-in-utero*; but it remained for Wiener and Peters, in 1941, to identify atypical agglutinins in the sera of three patients, with an anti-Rh agglutinin prepared in rabbit serum by Landsteiner and Wiener. That was the original flash of thought.

However, this little book is clear and eminently readable; the style is lucid and the type good. Popular rather than scientific, it is suitable for the busy practitioner who has little time for reading, for medical students, nurses and interested laymen.

SIR WILLIAM GOWERS.

ALL medical men who value reading of the pioneers of modern medicine will be grateful to MacDonald Critchley for his biography "Sir William Gowers, 1845-1915".² To the present generation of doctors the name Gowers is mainly remembered by its association with the direct cerebellar column, and it is interesting to note that in the very lectures describing the tract, Gowers expressed himself as very critical of the use of eponymous terms such as the columns of Turks, Goll, Burdach *et cetera*, yet posterity will continue to use the name Gowers's tract without question. Gowers was almost pedantic in his choice of words and his careful study of medical English led him to originate such terms as knee-jerk, amyotatic, abiotrophy, and fibrositis—all terms still in everyday use. Many nervous diseases which are now recognized with confidence even by medical students, were first described accurately by Gowers, and these include progressive lenticular degeneration, *myasthenia gravis*, ataxic paraplegia, musicogenic epilepsy, geniculate herpes, and *paramyoclonus multiplex*. Gowers also advocated the use of shorthand by all medical students and advised them to learn it before they commenced their studies.

There are not many personal notes in the book and the author states: "The legend of Gowers' unattractive personality must not be allowed to survive without pointing out that this was largely a facade which concealed a

sensitive kindness towards those who knew him better, and thereby understood him." Many famous men were nevertheless numbered among his friends, and such men as Osler, Horsley and Hughlings Jackson were his ardent admirers.

When Gowers was declining, Osler wrote to Weir Mitchell: "You will be sorry to hear that Gowers is very ill—his own disease, ataxic paraplegia, it looks like, and ascending, so that there are now bulbar symptoms." The author, however, states that the correct explanation is more likely to be found in a condition of generalized arteriosclerosis. The extent of Gowers's medical writing can be gauged from the bibliography which runs into 17 pages and lists a very great variety of subjects ranging from the many famous neurological studies to such topics as "What is Shorthand", "Some Fallacies in Auscultation" and "Arsenical Poisoning Among Beer Drinkers".

The task of a biographer is not an easy one, but MacDonald Critchley has performed his with great zeal, and presents a fascinating history of the man whom he terms the greatest clinical neurologist of all times.

REGIONAL ILEITIS.

CROHN's monograph on regional ileitis is an important production, since it records the ideas and experiences of the world's authority on this disease.³ Indeed "Crohn's disease" is often preferred as a name because the ileum is not the only part of the bowel affected.

The book is a reasonable statement of our present knowledge, clearly set out, well illustrated and substantiated by abundant examples from the writer's vast experience of 222 cases. It is of necessity a study of the statistics of the disease (so dearly loved by American writers) and of the radiological and pathological appearances to be expected. The disease becomes of importance in the differential diagnosis of external and internal fecal fistulae and of abdominal masses, and in cases of vague intestinal symptoms, which may simulate ulcerative colitis—a disease which, unlike regional ileitis, has a nervous element and a toxæmia relatively out of proportion to its pathological anatomy.

The disappointing features of regional ileitis, so clearly seen in Crohn's book and thereby, one would think, making its composition difficult, are two. Firstly there is gross anatomical abnormality with few symptoms, and secondly treatment is disappointing when one would have thought it easy. As Crohn states, the diagnostic radiological feature is the "string sign" (a term, originally used in relation to carcinoma of the colon). Yet obstruction is uncommon. The disease may spread insidiously to the extent of fistula formation without affecting the patient's health materially.

One is sympathetic with the main fault in the book, namely, that the section on treatment is disappointing. It is not easy to find a clear statement as to what Crohn recommends. This is understandable when one reads (page 131) that "there is a growing realization of the increasing incidence of recurrences following all types of surgical interference". Indeed, it is practically admitted that surgical intervention is palliative, and that an exclusion operation is the best in most cases except in the jejunal lesions when resection is advised.

The book is recommended as a clear, fair and unpretentious statement by an authority on the subject with adequate references to its literature.

PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY.

IN his introduction to "Physiological and Pathological Chemistry", Dr. L. Earle Arnow presents the subject to students with no previous knowledge of chemistry.⁴ Starting with the structure of the atom, he passes by rapid stages to the structure of vitamins, taking in his course some of the more important physico-chemical concepts. As all this is done in some four hundred pages, and as a good deal of space is taken up by illustrations and "study questions", it

¹"The Rhesus Factor", by G. Fulton Roberts, M.A., M.B. (Cantab.); Second Edition; 1949. London: William Heinemann (Medical Books), Limited. 7½" x 5", pp. 72. Price: 3s. 6d.

²"Sir William Gowers, 1845-1915: A Bibliographical Appreciation", by MacDonald Critchley; 1949. London: William Heinemann (Medical Books), Limited. 7½" x 5½", pp. 122, with illustrations. Price: 17s. 6d.

³"Introduction to Physiological and Pathological Chemistry with Laboratory Experiments", by L. Earle Arnow, Ph.D., B.S., Ph.D., M.B., M.D., with an introduction by Katharine J. Densford, R.N., B.A., M.A., D.Sc.; Third Edition; 1949. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsey (Surgical) Proprietary, Limited. 8½" x 5½", pp. 604, with 144 illustrations. Price: 30s.

⁴"Regional Ileitis", by Burrill B. Crohn, M.D.; 1949. New York: Grune and Stratton, Incorporated. 8½" x 5½", pp. 238, with many illustrations.

is obvious that only the briefest consideration of the numerous topics introduced is possible.

Remarkably little of importance escapes mention in this rapid survey. The survey and the questions might be quite useful to a third year medical student wishing to review his knowledge. It is difficult to imagine how a student without any previous knowledge of the subject could profit by such a condensed presentation. As the book is now in its third edition, it would seem, however, that it must have attained one of its objectives: that of complying in part with the requirements of Curriculum of the National League of Nursing Education.

The experiments described in the practical section of about a hundred pages advance from the most elementary chemical procedures to experiments on vitamins and hormones, again with profuse illustrations. In an appendix thirty-four pages are devoted to the description of methods for the removal of stains from clothing.

The book is well produced and has a comprehensive index.

ORTHOPÆDIC SURGERY.

THE third edition of "A Practice of Orthopædic Surgery" by T. P. McMurray is fittingly dedicated to Sir Robert Jones.¹ Liverpool has long been regarded as the home of orthopædic surgery. Hugh Owen Thomas conducted his practice in that city and laid down many of the principles which still hold good to this day. He was ably followed by his nephew, Sir Robert Jones. He it was who "spread the gospel" during the first World War. Professor McMurray had a long association with Robert Jones lasting almost twenty years. There is no one living better able to write of the principles as laid down by the great masters. Details may vary, but principles must be true and sound.

The book itself is really a short concise version of the ideas of the Liverpool School. The chapter on rigidity of joints is a gem—full of sound counsel and advice on that difficult subject—manipulation of joints. McMurray is the acknowledged master of knee-joint surgery and the chapter on "Disabilities of the Knee Joint" is a classic. Orthopædic appliances and splints are described in detail—even how to measure for them. Surgical tuberculosis is admirably presented. The whole range of orthopædic surgery with the exception of fractures is covered. Modern procedure is discussed and a critical analysis given of its value.

The book is most readable, profusely illustrated and excellently produced. It is not too much to say that anyone who is intending to study orthopædics should first read this book as an introduction to sound basic principles of the subject.

Notes on Books, Current Journals and New Appliances.

A YEAR BOOK OF TREATMENT.

THE "Modern Treatment Year Book, 1949" is produced on the same lines as its predecessors.² It is produced by *The Medical Press* and its scope is indicated by the subtitle: "A Year Book of Diagnosis and Treatment for the General Practitioner". There are 41 articles by many different authors. Some of the titles are interesting, for instance, "The Care of Old Age in the Home", "Head Injuries due to Road Accidents", and "The Modern Treatment of Hysteria in Children". All general practitioners should appreciate discussions on these subjects. It is doubtful whether they will value the articles on "Radical Excision of the Rectum Without Colostomy" and "The Internal Fixation of Fractures of the Long Bones". It may be argued perhaps that a knowledge of the way in which these procedures can be carried out will lead the practitioner to consult with suitable specialists when suitable occasions arise. This book will have the same appeal to general practitioners as its fore-runners have had.

¹ "A Practice of Orthopædic Surgery", by T. P. McMurray, C.B.E., M.B., M.Ch., F.R.C.S. (Edinburgh); Third Edition; 1949. London: Edward Arnold and Company. 8½" x 5½", pp. 452, with 191 illustrations. Price: 30s.

² "Modern Treatment Year Book, 1949: A Year Book of Diagnosis and Treatment for the General Practitioner", edited by Sir Cecil Wakeley, K.B.E., C.B., D.Sc., F.R.C.S., F.R.S.E., F.A.C.S., F.R.A.C.S. (Hon.); 1949. London: The Medical Press. 8½" x 5½", pp. 478, with a few illustrations. Price: 15s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Handbook of Digestive Diseases", by John L. Kantor, M.D., F.A.C.P., and Anthony M. Kasich, M.D., F.A.C.P.; Second Edition; 1949. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 8½" x 5½", pp. 662, with 149 illustrations. Price: £5 15s. 6d.

An attempt "to present simply, clearly, and concisely, the essential facts concerning the diseases of digestion".

"Iron Metabolism and its Clinical Significance", by A. Vannotti, M.D., and A. Delachaux, M.D.; translated by Erwin Pulay, M.D.; 1949. London: Frederick Muller, Limited. 8½" x 6", pp. 270. Price: 32s.

The subject of serum iron is viewed not only as a factor in clinical problems, but also as the manifestation of a biologically important element in connexion with the function and regulation of the whole organism.

"Diseases of Women", by ten teachers under the direction of Clifford White, M.D., B.S. (London), F.R.C.P. (London), F.R.C.S. (England), F.R.C.O.G., edited by Clifford White, Frank Cook and Sir William Gilliatt; Eighth Edition; 1949. London: Edward Arnold and Company. 8½" x 5½", pp. 476, with 170 illustrations. Price: 25s.

A composite work published originally in 1919.

"An Introduction to Clinical Surgery: Surgical Wherefores and Therefore: A Reasoned Explanation of Surgical Note-Taking", by Charles F. M. Saint, C.B.E., M.D., M.S., F.R.C.S. (England), Hon. F.R.A.C.S., Hon. F.G.S.S.; Second Edition; 1949. Cape Town and Johannesburg: Juta and Company, Limited. 9½" x 6", pp. 396, with 372 illustrations. Price: 45s.

An "essentially clinical" book based on tutorials given to surgical dressers.

"Industrial Toxicology", by Lawrence T. Fairhall; 1949. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 5½", pp. 500. Price: 64s. 6d.

Intended as a bridge between toxicological investigation and the application of knowledge of industrial poisons by the industrial hygiene expert.

"Treatment in Proctology", by Robert Turell, B.S., M.D., with a chapter on Psychosomatic Problems by Louis Linn, M.D.; 1949. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 5", pp. 268, with 85 illustrations, some of them coloured. Price: 75s. 8d.

A discussion of the treatment of anal, rectal and colonic diseases.

"Photoradiography in Search of Tuberculosis", by David Zacks, M.D.; 1949. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 6½", pp. 316, with 274 illustrations. Price: 53s. 9d.

A manual on mass chest radiography based on over twenty years' experience.

"A Manual of the Penicillia", by Kenneth B. Raper and Charles Thom, with the technical assistance and illustrations by Dorothy I. Fennel; 1949. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 5½", pp. 882, with 172 illustrations, some of them coloured. Price: £6 9s.

Designed primarily as a means for the identification of Penicillia and as a guide to the accumulated literature on the subject.

"Principles of Human Physiology" (originally "Starling's Principles of Human Physiology"), by C. Lovatt Evans, D.Sc., F.R.C.P., F.R.S., LL.D. (Birmingham), with a section on the special senses by H. Hartridge, M.A., M.D., Sc.D., F.R.S.; Tenth Edition; 1949. London: J. and A. Churchill, Limited. 9½" x 5½", pp. 1210, with 693 illustrations. Price: 42s.

The last edition was in 1945.

"Ophthalmic Medicine", by James Hamilton Doggart, M.A., M.D. (Cantab.), F.R.C.S. (England); 1949. London: J. and A. Churchill, Limited. 9½" x 6", pp. 344, with 87 illustrations, 28 coloured. Price: 32s.

Intended to emphasize how intimately the eye is linked not only with adjacent structures, but also with remote parts of the body.

"Money, Medicine and the Masses", by Albert D. G. Blanc, B.Sc., M.D., Ch.B., A.N.Z.I.C.; 1949. Wellington: A. H. and A. W. Reed. 7" x 4½", pp. 212. Price: 10s. 6d.

Written for New Zealanders, the book deals with the whole subject of medical care.

The Medical Journal of Australia

SATURDAY, DECEMBER 3, 1949.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE INAUGURATION OF THE COLLEGE OF RADIOLOGISTS (AUST. AND N.Z.).

An event which, it is hoped, will enhance the value of radiological practice and extend its usefulness in this part of the world, is the transformation of the Australian and New Zealand Association of Radiologists into "The College of Radiologists (Aust. and N.Z.)". This happening should not be allowed to pass unnoted; it marks the culmination of many years of development. The name of the new college was formally approved by His Excellency the Governor of New South Wales on the advice of the Executive Council in a letter dated October 7, 1949.

In February, 1935, The Australian and New Zealand Association of Radiology was registered under *The Companies Act, 1899*, of New South Wales. The two main objects of the Association as set out in the Memorandum of Association were as follows:

(a) To promote encourage and provide for the advancement and study of the sciences known as Radiology, Radioactivity, Physiotherapy and allied sciences and the carrying out of research and experimental work in connection with those sciences.

(b) To cultivate and maintain the highest principles of practice and ethics in respect of the said sciences or any of them.

In April, 1942, the name was changed by special resolution and the Association became the "Australian and New Zealand Association of Radiologists". Just why this association should now become a college is not clear. Perhaps colleges are the fashion, and no doubt a college is a more dignified body than an association. It may be that some store was set on the conduct of examinations and the granting of diplomas, certificates and so on, to be mentioned later. Whatever the reason, there is no ground for fault-finding by members of the medical profession generally. The important, and indeed the only, consideration is the efficient and speedy development of radiology and of all that goes with it, and its ready application to the problems of preventive and curative medicine. If cooperative effort as members of a college will help radiologists to do these things with more zest than as members of an association, by all means let us have the

college. The College of Radiologists (Aust. and N.Z.) will be affiliated with the British Institute of Radiology. This will be evidenced by the *per capita* payment to the British Institute of twenty-six shillings *per annum* that each Fellow and Member of the College may receive *The British Journal of Radiology*. It should here be mentioned that there is in existence an Australian Institute of Radiography—a technical body—and that a Conjoint Board has been formed by the Australian Institute of Radiography and The College of Radiologists (Aust. and N.Z.). This board will elaborate an Australia-wide syllabus for the training of technicians and a conjoint board of examiners. The British Institute of Radiology is incorporated with the Röntgen Society and is (we quote from *The British Journal of Radiology*) "an association of persons interested in Radiology and allied subjects". From this description it may be assumed that membership of the institute is not confined to medically trained and qualified persons. As will be shown later, The College of Radiologists (Aust. and N.Z.) has provision for associate members. Dr. J. E. Blewett is the representative of the new college on the British Institute of Radiology; he is known to Australians as a brother Australian and the Director of the X-Ray Department of King's College Hospital, London.

The aims and objects of the Australian and New Zealand Association of Radiology are those of The College of Radiologists (Aust. and N.Z.), for the latter came into being by change of name of the former. Attention should therefore be drawn to these aims and objects. On January 14, 1949, the Memorandum of Association was altered in respect of the objects of the Association. The first clause already quoted as that of the Australian and New Zealand Association of Radiology was altered* to read as follows:

(a) To promote encourage and provide for the advancement of the study of the science known as Radiology (diagnostic and therapeutic) and allied sciences and for the carrying out of research and experimental work in connection with these sciences and to encourage the study and improve the practice of radiology.

Another subclause, dealing with examinations and diplomas, and already referred to, is as follows:

(d) To conduct examinations and to grant to registered Medical Practitioners diplomas certificates or other equivalent recognition of special knowledge in Radiology either alone or in co-operation with teaching and/or examining bodies authorised to grant recognition as aforesaid provided always that every diploma certificate or other recognition granted independently by the College shall contain on the face of it a statement to the effect that it does not of itself confer or purport to confer any legal qualification to practise Radiology and that it is not issued under or in pursuance or by virtue of any statutory or Government sanction or authority but that it is issued by the authority of the College only.

In addition to subclauses dealing with the supervision of education in the sciences and the promotion of fitness of persons desirous of qualifying for membership of the college, and also with the rescission, alteration and amendment of by-laws dealing with the admission of Members and the election of Fellows, there is one to which particular attention should be drawn. It is as follows:

(h) To promote or oppose any legislative or other measures affecting any matters connected with Radiology or allied sciences as may be deemed expedient in the interests of the College.

On this provision it is necessary to frown. Emphasis has been placed in these columns on many occasions in the

past on the need for the use of one voice and one voice only when the medical profession or any section of it wishes to discuss with governments or other statutory bodies matters affecting medical practice in any of its aspects. The British Medical Association is the only body qualified to speak for the profession as a whole. If one section of the profession took it upon itself to espouse the cause of members of a specialty, confusion and disharmony would almost certainly occur. Any divergence of views would be seized on at once by the government or other body in question and the cause of the profession would be lost. This has been recognized by both The Royal Australasian College of Physicians and the Royal Australasian College of Surgeons. The College of Radiologists (Aust. and N.Z.) may be content to allow the subclause to remain among its Articles of Association, but it would be well advised not to act in accordance with its provisions in any circumstances.

In regard to the set-up of the College, it only remains to be stated that it will comprise Fellows, Life Members, Foundation Members, Ordinary Members, Student Members, Associate Members and Honorary Members. Fellows will be elected by the Council, and to be eligible as a Fellow, a Member must have had at least five years' practice as a specialist in radiology and shall have supplied such additional evidence of his eminence in his profession as the Council may in its sole discretion determine. Foundation Members will be medical practitioners who within a certain period of time fall into one or more of the undermentioned categories: (a) Those who are employing their full time in radiology or such other allied medical science or sciences as the Council may determine and who possess a diploma in radiology approved by the Council. (b) Those who are regarded by the Council as specializing in radiology or other allied science or sciences as above mentioned, but who are not necessarily employing their whole time as specialists in radiology. (c) Those who do not possess a diploma in radiology, but who are regarded by the Council as specialists in radiology. Ordinary Members will be appointed after the expiry of the period of time already mentioned. An Ordinary Member must: (a) be a registered medical practitioner of at least three years' standing; (b) have spent at least one year in general clinical work at an approved hospital; (c) have passed such examination as may be conducted by the college for the purpose. Student Members will be qualified medical practitioners engaged in a course of study of radiology approved by the Council. Associate Members may be elected from: (a) graduates of a university approved by the Council who have had at least two years' experience in physics or some other science in its application to radiology; and (b) persons who have given distinguished service in some sphere associated with radiology entitling them in the opinion of the Council to election as Associate Members. Honorary members are to be elected from "distinguished persons who have contributed by original research to the scientific advancement of the sciences of radiology, radioactivity, physiotherapy and allied sciences, or who have rendered some special service in the interests of the College or the said sciences for which the College desires to confer honour". Fellows will use after their names the letters F.C.R. (Aust. & N.Z.) and Members M.C.R. (Aust. & N.Z.).

The College of Radiologists (Aust. and N.Z.) will hold its inaugural session in Sydney from Monday, December 12, to Saturday, December 17, 1949. A series of scientific discussions and demonstrations will be held and papers will be read. On the evening of Wednesday, December 14, the Röntgen Oration will be delivered at the Great Hall of the University of Sydney by Dr. F. A. Maguire. It is expected that Dr. J. Stanley Verco, of Adelaide, will be elected first President of the College. The members of the Council are: Dr. A. J. Campbell (New Zealand), Dr. B. L. W. Clarke, Dr. A. R. Colwell, Dr. E. R. Crisp, Dr. W. H. Godby, Dr. H. J. Ham, Dr. W. P. Holman, Dr. A. J. G. Mackay, Dr. V. McDowall, Dr. D. G. Maitland, Dr. J. C. Mayo, Dr. A. T. Nisbet, Dr. R. Kaye Scott, Dr. T. L. Tyrer. Dr. D. G. Maitland is Honorary Treasurer and Dr. A. R. Colwell Honorary Secretary.

Current Comment.

MASS PENICILLIN PROPHYLAXIS.

THAT prevention is better than cure has been for a long time a basic maxim in the education of the non-medical public in health matters. The idea has caught on to a considerable extent and people look for prophylactic measures. Those which are known to be successful receive adequate publicity in most cases, but it is as well to be aware of those which have failed, so that time and trouble may not be wasted on following false trails either in mass experiments or in individual cases in ordinary practice. A good example of this is in a report by Clifford Kuh and Morris F. Collen¹ of a mass trial of penicillin as a prophylactic against respiratory infections. Nearly three thousand persons were included at the beginning of the experiment, being divided into two approximately equal groups for control purposes; a great many dropped out before the experiment concluded, a fact which upsets the analysis of some parts of the results, but the final data relate to 4582 patient-months in the experimental group and 4682 in the control group. No attempt was made to distinguish between virus and bacterial infections; while the penicillin was not expected to prevent virus infections or the common cold, it was thought that the drug might prevent bacterial complications or sequelae. It seems reasonable to comment on this point that the seemingly uncritical approach to "respiratory disease" in general was really the sound practical approach, for in the present state of our knowledge the general practitioner at least finds little opportunity or grounds for making fine or accurate distinctions within the group. In any event certain broad conclusions from the results seem clear. There was practically no difference between the two groups for either respiratory or non-respiratory illness in respect of incidence of illness, days lost from work or regular activities, days spent in hospital, or number of persons who sought medical advice; nor was there a difference in the incidence of respiratory infections amongst other members of the subjects' families. It may be mentioned that as some of the subjects dropped out of the experiment, it was possible to divert the available penicillin to those remaining, and the dosage was first doubled and then quadrupled; the increase had no apparent effect. Many relatively mild reactions were reported, both to the penicillin and to the placebo (a tablet of calcium carbonate) given to the controls, besides many reports of subjective improvement experienced by both experimental and control subjects; these reports do not affect the conclusions from the results viewed objectively. It is worthy of note that some subjects involved in the experiment have since asked for penicillin

¹ The Journal of the American Medical Association, August 27, 1949.

for prophylactic purposes, their number including some who (unknown to themselves) received the placebo; because of the results they have been discouraged. No evidence has been obtained that subsequent therapeutic administration of penicillin was hampered by the previous taking of prophylactic doses; but the data on the point are limited, and the possibility is one that cannot be dismissed at present. However, the general result seems to discount completely any idea that penicillin may be considered as a prophylactic against the scourge of respiratory infections. An interesting incidental point in the paper is the fact that when the experiment was being considered, it was realized that 730,000 tablets of penicillin would be needed and an equal number of placebos; the cost would be over \$100,000. The proposal was presented to the head of the laboratory division of a large chemical company, who promptly responded favourably. Such a state of affairs certainly simplifies research.

TRIHXYPHENIDYL THERAPY FOR PARKINSONISM.

ANOTHER new drug has been put forward as likely to be helpful in the treatment of parkinsonism. It is trihexyphenidyl or "Artane", a member of a new series of antispasmodic compounds. A report on its effects in 117 cases of Parkinson's disease has been presented by Lewis J. Doshay and Kate Constable,¹ who mention that, since the preparation of the paper, they have used the drug in some 150 additional cases with favourable results. They state also that the drug has been under study at other clinics, and verbal reports show that the results fairly closely coincide. Trihexyphenidyl was not used clinically until extensive pharmacological tests had been carried out with laboratory animals; in this it was proved that the action of the drug mildly resembled that of atropine in the control of sialorrhoea, in cycloplegic effects and in cerebral stimulation, but it was entirely free of the toxic effects of atropine on the cardiac vagus innervation, blood pressure and circulation. It was then applied to a clinical study in 117 cases of parkinsonism, of which 47 were post-encephalitic, 33 idiopathic and 37 arteriosclerotic. The investigation, which was pursued for periods ranging from six months to two years, not only indicated the therapeutic value of the drug, but also demonstrated a remarkable freedom from undesirable side effects. In the experience of Doshay and Constable, "it is an unusually mild drug, overdosage of which is almost impossible"; it is "safe for use by the young and the old, the ambulatory and the infirm, the hypertensive, the cardiac and the nephritic". It was found on all scores to be a valuable addition to the drugs already in use for the treatment of parkinsonism; besides the peripheral effects which it shares with other drugs, it has an unusual cerebral-stimulating action, which is particularly effective in combating the depression and inertia prevalent among these patients. These investigators consider it the drug of choice in arteriosclerotic and idiopathic cases of parkinsonism, and they recommend that it should be regularly tried in post-encephalitic cases in which atropine or other forms of medication prove disturbing or ineffectual. As with other drugs, "Artane" is more effective when its administration is combined with physical therapy and exercises. In adding this drug to the list of those of value in the treatment of patients with parkinsonism, we may well note two points brought out by Doshay and Constable. The first is that in the long-drawn-out course of the disease, patients regularly tire of one drug after another, so that the physician must have his armamentarium continually renewed. Nevertheless, 80% of the patients who have been started on trihexyphenidyl therapy have continued it month after month, without desire to change to another drug and without expressions of dissatisfaction. The second point is counsel for the over-enthusiastic. It is that since we have no cure for patients with parkinsonism, and there is none in the offing, the

purpose of all available therapy should be to render the patient as happy, active and useful as possible; hence it is never wise to force a new remedy on a patient who is content with his present regimen of treatment. Trihexyphenidyl appears to be a useful drug to have in reserve.

CORONARY OCCLUSION IN A YOUNG GIRL.

ALTHOUGH it is generally appreciated that coronary occlusion is not the exclusive prerogative of the middle-aged and elderly, cases occurring in youth are rare enough to warrant notice. W. G. MacDougall has reported² a case of coronary occlusion with a fatal outcome in which the patient was a girl aged sixteen years. This girl, a shop assistant, had been well until fourteen days before her admission to hospital. Then she suddenly developed, when hurrying home from work, breathlessness and pain across the lower part of the chest and in the upper part of the abdomen; the symptoms subsided with rest after she arrived home. They recurred every day. On the tenth day she consulted her doctor, but did not go to bed as he advised. She was more breathless than usual that evening. Next morning early she woke with gross dyspnoea and severe pain, which continued for thirty-six hours, with vomiting. She was then admitted to hospital, but died within twenty-four hours. *Post mortem* the heart muscle was found to be pale, soft and very thin, with evidence of previous hypertrophy. A large recent infarct involved the lower part of the interventricular septum, the anterior part of the apices of both ventricles and the posterior part of the left ventricle; in the area of infarction one of the posterior branches of the left coronary artery contained a thrombus. Evidence of previous infarction was found in the upper part of the posterior wall of the left ventricle. A moderate-sized infarct was present in the left lung. Microscopic examination of the heart muscle revealed areas of infarction of varying ages from less than two hours to more than three months. Various vessels contained thrombi, and in a small section of these vessels supplying the area of recent infarction was seen "a localized acidophil necrotic appearance, with polymorph infiltration". In one of the lung sections recent thrombi were seen in the pulmonary vessels, but the vessel wall showed no sign of necrotic or degenerative change. No evidence of primary arterial disease was found elsewhere. MacDougall considers that the findings in this case confirm the view of T. Leary, expressed in his comprehensive papers on the genesis of atherosclerosis,³ that the pathological lesion in the younger group of patients is a subendothelial fibrosis, with necrosis of the intima leading to thrombosis. This general subject of the pathological condition underlying coronary occlusion in children and infants is of considerable interest. W. A. Stryker,³ in presenting the results of post-mortem examination of nine infants or children under the age of seventeen years, in which coronary artery occlusion was an important feature, points out from these and from a review of the literature that the underlying pathology of the condition differs in children from that which is usual in adults—arteriosclerotic disease of the atheromatous type. He listed eight types of lesion found in this young group: medial calcification with fibroblastic proliferation of the intima, *polyarteritis (periarthritis)*, *nodosa*, arteriosclerosis (atherosclerosis), syphilitic arteritis, embolism, congenital abnormalities, rheumatic arteritis and intimal proliferation due to hypertension. Most of these conditions are rare in adults; arteriosclerosis, the common adult condition, is rare in children, and in Stryker's own personal series was not observed at all. The significance of these observations is not yet fully established. From the clinical viewpoint the important fact to note is Stryker's statement that obliteration or partial occlusion of the main or smaller coronary stems can appear at any age and has been encountered even in stillborn infants. It is rare, but should not cause astonishment when it appears.

¹ *The Lancet*, August 6, 1949.

² *Archives of Pathology*, April, 1936, and October, 1941.

³ *American Journal of Diseases of Children*, March, 1946.

¹ *The Journal of the American Medical Association*, August 27, 1949.

Abstracts from Medical Literature.

PATHOLOGY.

Subacute Cor Pulmonale in Diffuse Carcinomatosis of the Lungs.

A. D. MORGAN (*The Journal of Pathology and Bacteriology*, January, 1949) describes a case of *lymphangitis carcinomatosa* with right ventricular hypertrophy, the primary tumour being a scirrhous carcinoma of the stomach. He states that a study of the literature of diffuse carcinomatosis of the lungs reveals that in three-quarters of the cases the primary tumour was a gastric carcinoma, seldom diagnosed during life. Analysis of the microscopic reports in 78 published cases shows that there is no clear-cut histological distinction between the group in which spread to the lungs is obviously hematogenous and that in which it is held to be due to retrograde spread from the hilar lymph nodes (*lymphangitis carcinomatosa*). In one-third of the cases of *lymphangitis carcinomatosa* tumour cells were found in the blood vessels as well as in the perivascular lymphatics, frequently associated with diffuse obliterative endarteritis or organized thrombosis. In ten of the eleven cases accompanied by right ventricular hypertrophy, an obliterative lesion of the pulmonary arterioles was present in the form of intravascular fibrosis or more recent thrombosis. There is thus reason to believe that subacute *cor pulmonale* is due, not to *lymphangitis carcinomatosa per se*, but to occlusion of the pulmonary arterioles. The suggestion is made, in the light of these findings, that *lymphangitis carcinomatosa* follows a hematogenous spread of tumour cells to the lungs rather than a retrograde spread from the hilar lymphatics.

Asphyxia Neonatorum and the Vernix Membrane.

FRED DICK, JUNIOR, AND EDGAR R. PUND (*Archives of Pathology*, April, 1949) state that a vernix membrane forms in the lungs of a significant number of liveborn infants, and this leads to asphyxia within a few hours to four days after birth. Although a high percentage also have pneumonia, there is usually no other obvious cause of death. This membrane prevents exchange of gases in opened alveoli and is associated with vernix in terminal bronchioles and alveolar ducts; atelectasis follows owing to obstruction and resorption. In these infants the vernix is extremely rich in lipids and is present in large amounts in the respiratory tract and alveoli before birth. The vernix may have been concentrated in the lung either because of absorption of fluid by way of exchange through alveolar and prealveolar capillaries or because only small amounts of amniotic fluid were present. The presence of the membrane may represent only a variant of the aspiration of amniotic debris and *vernix caseosa* so frequently found to be a cause of *asphyxia neonatorum*. After the first extra-uterine breath, this material in part is forced against the walls of alveoli and alveolar ducts, while that present in

the upper part of the respiratory tract lodges in the respiratory bronchioles. As extrauterine respirations become more forceful, greater expansion takes place, and more vernix is aspirated into the smaller units from above. Its high incidence in association with congenital pneumonia is probably due to the increased stickiness of the respiratory passages which has developed during the inflammatory process. Intrauterine anoxia may produce exaggerated intra-uterine respiratory movements with aspiration of greater amounts of amniotic fluid, but death in that case is primarily due to damage within the central nervous system. It is postulated that the necessary factor concerned with development of the membrane is concentration of vernix, which has an extremely high lipid content. Pneumonia prepares a fertile field for its development. Exaggeration of intra-uterine respiratory movements is a factor only in those cases presenting the aforementioned prerequisites. Aspiration may be of no avail in many cases when much of the vernix is beyond the tracheal bifurcation, but in others it may forestall more extensive involvement of the lung, and death of the infant may be prevented.

Experimental Hepatic Fibrosis and Cirrhosis.

T. GILLMAN AND I. L. CHAIKOFF (*Archives of Pathology*, July, 1949) state that the four points of significance which emerge from a study of the genesis of hepatic fibrosis and cirrhosis in the dog are the following. First, in the dog's liver fibrosis may originate periportal, between the parenchymal epithelial cells (interstitial) and/or around the radicles of the hepatic veins (centrolobular). These three forms of fibrosis can usually be distinguished easily in the early stages. Second, some forms of fibrosis, especially the centrolobular form and perhaps the periportal and interstitial forms, appear to be related to the fatty change. But even in the centrolobular form, in which the association of the fibrosis with fat is usually more obvious, the fatty liver cells may remain quite intact and may not degenerate until the fibrosis is well advanced. In fact, the centrolobular fibrosis described here closely simulates, in pathogenesis, the reactions described in chronic cardiac decompensation in man and in passive venous congestion of the liver in dogs. When this reaction occurs in the congested liver, it does not seem to be associated with, or preceded by, fatty changes in the liver cells. Possibly the circulatory changes occurring in a very fatty liver induce effects on the supporting reticulum similar to those occurring after long-standing venous congestion. Should this be the case, then attention must be devoted not only to the hepatocellular degeneration, but also to the role of the vascular changes in the liver in the genesis of hepatic fibrosis. The phenomena recorded to this point indicate that there are factors other than hepatocellular degeneration to be considered as being responsible for proliferation of the connective tissue of the liver. Special conditions seem to be necessary for hyperplasia of the connective tissue of the liver, for fibrosis does not necessarily follow even massive hepatocellular damage; in fact, entire lobes of the liver may atrophy and disappear without any associated connective tissue response. Not only is this the

case for the liver, but a similar observation appears to hold true for the pancreas and the salivary glands. Thus, the authors have encountered reactions primarily in the interlobular septa of the dog's pancreas or interstitial fibrosis in the human pancreas or even complete degeneration of the acinous tissue without any connective tissue reactions whatsoever. These observations concerning the liver and the pancreas of man and several laboratory animals indicate that special conditions are necessary for the development of fibrosis in these organs. It would seem that the parenchymal cells and the supporting tissues of these organs, while frequently reacting simultaneously, are nevertheless two independently reacting systems. The third significant fact emerging from this study is that several different forms of fibrosis can occur in the livers of a group of dogs subjected to identical experimental procedures. In view of this last observation the authors are led to another conclusion—that the end stages of hepatic cirrhosis in dogs treated in different ways may be pathologically similar, even though the causation of the lesions and their genesis may be quite different. It seems that no conclusions concerning either the cause or the genesis of a cirrhotic process can be drawn from an examination of a single section of a liver taken at a single moment during the end stages of the disease.

Plasma Proteins and Liver Disturbance.

KWOK-KW CHENG (*The Journal of Pathology and Bacteriology*, January, 1949) suggests that the present state of our knowledge of the origin of plasma proteins is highly unsatisfactory. The custom of assigning the role of protein production mainly to the liver has apparently sprung from the frequent association of liver diseases with alteration of the plasma-protein level. But the experimental evidence brought forward in support of an hepatic origin is inconclusive and open to serious criticism. The author has failed repeatedly in attempts to induce disturbance of plasma-protein behaviour by subjecting the liver experimentally to severe damage. The facts elicited therefore lead to the conclusion that, in the past, too much emphasis has been placed on the part played by the liver in the elaboration of plasma proteins. The mechanism of synthesis is likely to be far more complicated, and extrahepatic factors probably intervene. The numerous and diverse sites of origin proposed suggest that different plasma proteins may be manufactured in widely separated organs and cells with different mechanisms of synthesis. Evidently many more data on this subject are needed in respect of both normal and abnormal plasma proteins.

Teratomata of the Pineal Region.

KENNETH WALTON (*The Journal of Pathology and Bacteriology*, January, 1949) states that the presence of "pinealomatous" areas in a typical pineal teratoma and the transition of an atypical teratoma to a pinealomatous structure in its seedlings, support the view that many tumours in this region, reported as pinealomata, are really atypical teratomata. Since similar "pinealomatous" areas occur in intracranial teratomata situated else-

where than in the pineal body and even in teratomata occurring in other parts of the body (testis and ovary), the resemblance of these areas to the fetal pineal body is not conclusive evidence of their origin from pineal tissue. In some cases the pineal body is demonstrably not involved, and in these the terms "parapineal teratoma" and "ectopic pinealoma", which suggest an origin from the pineal body, are not justified. In other cases close examination of the tumour often suggests that an inert pineal body has become involved, by virtue of its anatomical position, in a tumour originating nearby from the posterior end of the third ventricle or from the quadrigeminal plate. Here again a primary pineal origin is doubtful. These tumours are often invasive, and microscopic involvement of the floor of the third ventricle is often of greater extent than naked-eye examination would suggest. Interruption of the supra-optico-hypophyseal tract in this manner accounts for the occasional production of *diabetes insipidus*. The occasional occurrence of abnormalities of sexual development in association with these tumours is probably also due, not to the involvement of the pineal body, whose endocrine function is doubtful, but to spread to the hypothalamic area or the hypophysis.

MORPHOLOGY.

Double Ureters.

I. W. MONIE (*The Anatomical Record*, February, 1949) describes two cases of ureteric duplication in human embryos. He states that double ureter is a relatively common clinical and autopsy finding and accounts for 2% to 4% of all anomalies of the urinary tract. The condition may be complete or incomplete and may be unilateral or bilateral. All manner of combinations may occur, but bilateral complete double ureter is the least common of all cases of duplication of the ureter (one case in 144 autopsies and two in 500 consecutive excretion pyelographies). With regard to the mode of termination of the ureters in the bladder wall, the ureter draining the upper part of the renal pelvis opens into the bladder caudal and medial to the ureter from the lower renal pelvis (Weigert-Meyer rule).

Head Moulding and Growth of Infant Human Head.

M. H. ORTIZ and A. G. BRODIE (*The Anatomical Record*, March, 1949) report a serial, cephalometric radiographic study of the human head from birth until the third month of life. The material consisted of 135 newborn infants, including five delivered by Caesarean section, of whom X-ray examinations were made at regular intervals beginning within an hour after birth. Examination of the heads of Caesarean-delivered babies revealed that the typical pattern had already been attained *in utero*. The moulding of the normally delivered head was shown to be a matter of a tipping forward of the occipital squama, with the cartilaginous junction at the posterior margin of the *foramen magnum* acting as a hinge, a bending backward of the halves of the frontal bone and a squeezing superiorly of the parietal

bones. Distortion of the basicranium, as advanced by Moly, could not be demonstrated. The occipital squama contributed mainly to the recovery of the dolichocephalic (long) head, the frontal squama to that of the brachycephalic. In some cases the parietals sank down, and in others they maintained their positions. Complete recovery (attainment of a smooth contour) took place by the third day in the majority of cases. The anterior cranial base (centre of *sella turcica* to nasion) was found to be longer at birth than was the posterior (*sella turcica* to Bolton point). The distance from *sella turcica* to Bolton point increased at such a slow rate that it did not lend support to the generally accepted idea that the spheno-occipital junction is an important growth centre. In over a third of the sample there was evidence that the sphenoid and presphenoid had not fused at birth, and in some that the *canalis cranio-pharyngeus* was still patent. These signs disappeared by the end of the first month. Measurements made on the facial skeleton supported the concept that the plane of interaction between cranial and upper facial growth involves the coronal, fronto-sphenoidal, pterygo-maxillary and zygomatico-temporal sutures, all of which lie in a common frontal plane, and the transverse palatal suture, which lies parallel but slightly anterior to it. Measurements between this plane and one parallel to it passing through the centre of the *sella turcica* increase slowly for the first year of life. Studies in older children indicate that it then becomes stable and further forward movement of the facial mask is a result of depositions occurring at the posterior aspect of the facial junctions with this plane.

Structure of Liver.

H. ELIAS (*American Journal of Anatomy*, March, 1949) states that the conventional notion of the hepatic cord as a long, cylindrical structure is shown not to be tenable in four mammalian species, including man. This conclusion is based on a very careful reexamination, from serial sections *et cetera*, of the parenchymal architecture of the liver. The author states that the mammalian liver is fashioned of cribriform sheets or plates (*laminae hepatis*), one cell thick. These sheets anastomose with one another and enclose between them spaces which contain the sinusoids. These spaces (*lacunae hepatis*), which form a continuous labyrinth (*labyrinthus hepatis*), are shaped like wide sacs with flexible walls in man and the cat. The liver of man and cat is therefore tentatively called a saccular liver (*hepar sacculare*). The spaces are narrow and cylindrical in the horse and rabbit, the liver of which is tentatively named a tubular liver (*hepar tubulare*). Intermediate types seem to exist in other mammals.

Relation Between Coronal Suture and Cerebrum.

L. P. ROWLAND and F. A. METTLER (*Journal of Comparative Neurology*, August, 1948) report that neither the position nor the inclination of the coronal suture is constant with respect to other skull landmarks. The relation of the trephine opening of the lateral approach to the underlying cerebrum was studied by inserting a straight pin through the Freeman-Watts landmark

in cadavers. In a large series of dissecting-room cadavers (305 hemispheres) and in a smaller series of fresh post-mortem material (20 hemispheres), as well as in six living patients, the position of this point, relative to the longitudinal, central and lateral fissures of the brain, showed wide variation. Furthermore, it was noted that although the coronal suture usually overlies some part of the *pars triangularis*, it is not infrequently in relation to the *pars orbitalis* or *pars opercularis*. These findings indicate that the coronal suture is not a reliable guide to cerebral anatomy. Incisions made in the plane of the coronal suture do not consistently enter the cortex at the same point. The variation inherent in this procedure may account for some of the variable results encountered in psychosurgery. It may help to explain failures in cases in which other factors point to a good prognosis. Although many of the incisions enter the cortex in or near Broca's speech area, aphasia has not been a prominent complication of the operation.

Anomalous Right Subclavian Artery.

T. A. STEEBINS (*The Anatomical Record*, February, 1949) describes an extremely rare case of anomalous arrangement of arteries arising from the aortic arch in man. These arteries are in order, bicarotid trunk, left vertebral, left subclavian, and right subclavian (retro-oesophageal). Associated with this arrangement are a lack of the right recurrent nerve, abnormality in the right sympathetic plexus, dilatation at origin of the anomalous right subclavian artery, and a marked difference in diameters of the left and right vertebral arteries. This anomalous arrangement is compared with others in the literature.

Vitamin C Deficiency and Bone Repair.

P. D. F. MURRAY and E. KODICEK (*Journal of Anatomy*, April, 1949) report that in partial vitamin C deficiency the formation of callus at the site of fractures of the fibula was lower, and the amount of callus formed was at first less than in dietetically normal animals. Whereas in normal animals the callus later consolidated into compact bone by thickening of the trabeculae, in the partially deficient animals this did not occur; the callus might become extremely extensive, covering the whole diaphysis, but always retained a lightly built, trabecular structure. In a large proportion of animals receiving a diet partially deficient in vitamin C, the knees became stiff and could be bent only painfully and with difficulty. Evidence is presented indicating that this condition was caused at least in part by local histological changes. The manner of fracturing the fibula caused some injury to muscle, and damaged muscle fibres degenerated. In dietetically normal animals they quickly regenerated. In animals with partial vitamin C deficiency, much more muscle degenerated than in dietetically normal animals, and the muscular tissue so lost was replaced by large masses of hyperplastic connective tissue and did not regenerate. A large part of the limb musculature might thus disappear. The process of degeneration of the muscle fibres and the development of the hyperplastic connective tissue are described.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at Sydney Hospital on September 22, 1949. The meeting took the form of a series of clinical demonstrations by members of the honorary medical and surgical staffs of the hospital. Parts of this report appeared in the issues of November 5 and 12, 1949.

Horseshoe Kidney with Complications.

DR. ALBAN GEE presented three patients, who, on investigation, had been found to have horseshoe kidneys with other renal tract abnormality. The first patient was a man, aged fifty-two years, who had suffered attacks of left lumbosacral pain for the previous five years. A recent attack had been accompanied by hematuria, and an excretion urogram subsequently revealed a horseshoe kidney, the right half of which was normal. The left half showed gross hydronephrosis, and there were numerous calculi of varying sizes in the middle and lowest calyces of the pelvis. Retrograde pyelograms gave similar findings, and the left half was shown to have a poor function. At operation the fusion of the two kidneys was demonstrated, with a bridge of tissue more than one inch wide joining them. This was divided, and a vessel running directly from the posterior aspect to the aorta was ligated. There were many other vessels of abnormal origin which had to be ligated before the left half of the kidney could be removed.

The second patient was a man, aged forty-seven years, who had suffered with backache for some years, and intermittent complete hematuria for the previous two weeks. Various treatments had been given in an attempt to relieve his pain, but no radiograph had been taken until the hematuria appeared. An excretion urogram did not show good excretion, and an opacity was present in the left renal area, and the lowest calyx appeared to be directed medially. A left retrograde pyelogram showed that a horseshoe kidney was present, and that the stone was localized in the pelvis. Pyelolithotomy was easily performed through an anteriorly situated pelvis. On analysis the stone was found to consist of calcium oxalate.

The third patient was a woman, aged thirty-five years, who presented with symptoms of lower urinary tract infection. She had had five children, the eldest aged sixteen years and the youngest aged four years. For the previous two years she had suffered from severe frequency of micturition, chiefly in the daytime, and the feeling of never fully emptying her bladder. Cystoscopic examination showed chronic posterior urethritis, for which diathermy was applied. This was followed by daily bladder instillations of 1% silver nitrate solution for one week. As a check on the upper part of the urinary tract an excretion urogram was taken. The radiographs showed classical horseshoe kidneys in such clear detail that they were deemed worthy of demonstration.

In discussing these patients, Dr. Gee pointed out that the advent of excretion urography had revealed many cases of fused kidneys that would normally not have been known. The older writers gave the incidence as one in 700 necropsies, though the Mayo Clinic figures were about half that. The incidence was currently believed to be about one in every 200 persons. Stone as a complication was uncommon, and had not been seen in any of the cases found at necropsy at the Mayo Clinic between 1905 and 1938. Radiographs showed distorted pelves and calyces due to abnormalities of rotation and position of the kidneys. Mostly the pelvis lay anteriorly, and the lower calyces pointed medially and lay closer than usual to the mid-line, while the ureter passed in front of the lower pole or over the isthmus. While operations on the pelvis might be straight-forward, removal of one-half of the horseshoe kidney might be associated with great difficulty owing to the anomalous blood vessels frequently encountered.

Bladder Diverticula.

Dr. Gee then presented a man, aged forty-seven years, who had been well until nine months previously. At that time he had a sudden attack of acute retention of urine, which was relieved by the passage of a catheter. Since then it had recurred on several occasions, on each occasion the passage of a catheter being necessary. Ever since the first attack he had had increased difficulty in passing urine; the act was slow to start and resulted eventually in only a thin weak stream. Blood had been present on two occasions, and there was considerable frequency of micturition with some

scalding. A full bladder was palpable, and the urine was very dirty with a strong odour. A small, soft prostate could be palpated on rectal examination. An excretion urogram in the country had revealed dilatation of the left urinary collecting system including the ureter. A cystoscopic examination revealed a median bar and two small lateral lobes of the prostate. The right ureteric orifice was normal, but the left was not seen. The openings of two diverticula were found, one in the mid-line and the other to the left side and behind the trigone. The full extent of those could not be reached with the panendoscope. A catheter was easily passed to the right kidney. There was a freer efflux than normal, and a satisfactory result was obtained with the blue test. A pyelogram showed slight clubbing only. Cystograms revealed two huge diverticula, each as big as the bladder itself. As a further excretion urogram had shown a hypoplastic kidney on the left side without dilatation (the original films were not available for comparison), it was felt that an attack on the bladder neck might be sufficient to promote adequate drainage. An endoscopic resection was then performed. At the time of the meeting, six months afterwards, the patient reported that he felt better than he had done for years, that he had no urinary discomfort, and was working harder than ever on his farm. It had not been possible to have follow-up radiographs taken, but the result of applying the principle of eliminating stasis and promoting drainage had been well demonstrated.

Carcinoma of the Kidney.

Dr. Gee's last patient was a man, aged forty-four years, who some years before had had a transient complete hematuria. No action was taken at the time, nor when it recurred five years prior to the meeting, associated with an attack of left-sided renal colic. Two years before the meeting it had again recurred as painless hematuria, but beyond a varicosity in the bladder, no abnormality was detected. When examined in hospital the patient had a history of several attacks of left-sided renal colic with hematuria extending over the previous two days, but he was by then symptomless. An excretion urogram did not show the calyceal details well, and no abnormality could be definitely seen. Cystoscopic examination revealed a normal bladder with no obstruction to the passage of a catheter to either kidney. The blue from the left side was, however, considerably less intense than that from the right. A left pyelogram showed a definite filling defect of the lowest calyx, which was irregularly cut off. The radiographs from the patient's examination two years previously were by that time available, and on comparison, the same filling defect could be seen, though it was not so pronounced as in the present series. At operation, a rounded tumour occupying the lower pole was found, and nephrectomy was performed. Examination of sections showed the tumour to be a carcinoma with clear cells predominating, surrounded by a false capsule of compressed renal tissue. The patient made an uneventful recovery and a year later reported being very well.

Dr. Gee said that the interest in the case lay in the known long history of the tumour's existence prior to diagnosis, and the fact that even then it measured only a little over one inch in diameter. The importance of repeated check examinations in all cases of hematuria was well shown.

Special Correspondence.

LONDON LETTER.

FROM OUR SPECIAL REPRESENTATIVE.

"Looking Backward."

WHEN a new project has been running for some time it is wise to take stock and consider if there was a need for the venture, and if so, has the need been met. In the case of the Empire Medical Advisory Bureau events have proved that answers to both questions are in the affirmative. A conservative estimate suggests that there are between 600 and 700 overseas doctors in the United Kingdom on post-graduate work, and it is felt that this number will rise rather than fall; 61 new inquirers visited the bureau in September, the highest monthly total to date. The monthly "At Homes" are well patronized with a total attendance of over 700 in the last nine months. At first

attention was wisely concentrated on those visiting practitioners in or near London, but now the ambit is being extended and "At Homes" are to be held during the coming months in Edinburgh and Liverpool.

The director is asking post-graduate deans of medical schools throughout the United Kingdom to supply him with the names of overseas doctors in their areas, and those not already on the books of the bureau will be written to with offers of help, should the need arise. By this means it is hoped to have a comprehensive register of visiting doctors. Whether or not this list should be given publicity through the medical journals is a matter for decision at a later date. As the effects of the war lessen, at least scholastically, more opportunities for post-graduate and kindred work offer and a revision is being prepared of the useful summary of regulations for post-graduate diplomas and courses of instruction in post-graduate medicine issued some time ago.

The bureau was established, and is maintained, by the Parent Body as a gesture of goodwill towards, and for the help and benefit of, members coming from overseas. Editorial mention was made of it some time ago (*THE MEDICAL JOURNAL OF AUSTRALIA*, May 21, 1949, page 693), and further experience and knowledge of its work strengthens the favourable opinion then set out: "good wine needs no bush".

"Looking Forward."

The end of World War I saw the setting up in London of the Fellowship of Post-Graduate Medicine, and with the end of World War II the British Post-Graduate Medical Federation was getting well into its stride. The post-war problem of finding suitable accommodation in London for the increasing number of post-graduate medical students arriving from overseas would have been even more acute but for the foresight and drive of the late Mr. F. C. Goodenough, who, in 1930, founded the Dominion Students Hall Trust, the parent body of London House.

Mr. Goodenough had for a long time felt very keenly the necessity of providing an alternative to the loneliness of the London boarding house by establishing a well-planned centre where overseas men, in whatever faculty they were studying, could live and gain the maximum value from their association.

Designed by the late Sir Herbert Baker, the new buildings of London House were opened by Her Majesty Queen Mary in 1937, although at that time only a third of the projected building scheme had been completed. During the war years building operations had to be suspended, but work was restarted in January, 1948. When the whole scheme is completed there will be room for 300 students in their own study bedrooms, and recreational amenities will include a swimming pool and four squash courts.

At present, some 200 students can be housed (some of them in temporary accommodation), while a fine dining hall, a library and comfortable common-room are already available for their use.

Work on the new buildings is going ahead well, and it is hoped that the whole building plan will be completed by the end of 1951.

London House is situated close to the University of London, the British Medical Association and British Medical Association House, and is within easy reach of many of the teaching hospitals, the Inns of Court and the Royal Institute of British Architects.

London House has three aims: (a) To provide good residential accommodation at reasonable charges. (b) To provide the necessary professional assistance and contacts not only to the student on his arrival, but also during his studies and after these have been completed. (c) To cater for the students' well-being by arranging visits, social contacts, games and other activities and to help them to gain a real insight into the traditions and customs of the United Kingdom.

Early in 1948, the Dominion Students' Hall Trust was able to purchase the 26-acre Foundling Estate which surrounds London House. Plans are being considered regarding the use of this newly acquired property, and immediate steps are being taken to extend the scope of the original London House scheme. There is, for instance, an urgent need for a residence for women students, which, with perhaps similar amenities for a proportion of married students, could be established close to London House and share its overheads.

Apart from these developments, the purchase of the estate will enable offices and other accommodation to be offered to certain Commonwealth and post-graduate organizations, so that in course of time a complete academic centre adjacent to London House is well within the realms of possibility.

As London House grows, so does the number of men wishing to use it. The controlling staff hopes that intending residents will help them by applying for accommodation as early as possible.

"It is a Capital Mistake to Theorize before One has Data."

This axiom or aphorism, written by a doctor (and how many of those reading can name him?), sums up concisely and correctly a recent *volte-face* in the regulations of the National Health Service. The supplying of drugs, free of charge, was one of the cardinal points claimed to be an integral part of the service and was stressed again and again by the Minister of Health in time gone by. The first doubt arose when in his budget speech in the early part of the year the Chancellor of the Exchequer hinted at the possibility of a "Health Tax", and when this point was raised at a Press interview in early October, Mr. Bevan "smiling put the question by". A shrewder appreciation of the position was shown by a leader writer when he wrote in the *British Medical Journal* (October 15, 1949, page 855): "It seems likely that sooner or later Mr. Bevan . . . will have . . . to introduce some scheme of payment which will be a greater detriment than mere exhortation to the public to be careful about spending money provided almost entirely out of the taxpayer's pocket." The leader writer had not to wait long to see his prophecy fulfilled, for on October 24 the Prime Minister, when detailing the "cuts" to be made in connexion with the devaluation of the pound sterling, announced in the House of Commons: "We propose to make a charge of not more than one shilling for each prescription under the national health service. . . . Arrangements will be made to relieve old-age pensioners of the charge for prescriptions." The main reason for this charge is that the service is already costing twice as much as was estimated and only a small part of the capital expenditure envisaged, new hospitals, health centres *et cetera*, has been put in hand. Out of the estimated yearly cost of almost £300m., about £40m. comes from the weekly contributions paid by each person; the remainder is drawn from national and local taxation. A committee is already at work drawing up a list of drugs outside which the general practitioner need not go except in special cases; the trouble will come over the "special" cases.

Both the leading weekly medical journals regard the proposed change as fundamental and revolutionary in that it marks a departure from a system which has been in operation for nearly forty years, under which no insured person was asked to pay for the medicines provided. While regretting that the decision was not taken earlier, the *British Medical Journal* feels it will help the general practitioner in that "it may lead to a lessening of the very heavy burden of work he has to bear at present"; it will also deter people from getting "ordinary household remedies at the country's expense". A case was recently reported of a woman who, against all medical advice, insisted on having her incontinent husband transferred from hospital to his home and demanded an air bed, two bed pans (one porcelain and one rubber), a urinal, gauze, cotton wool, ready-made swabs, talcum powder, surgical spirit and supplies of medicines, tablets and ointments. When it was pointed out that some of these articles were not on the drug tariff she asked for a toothbrush for her husband (*British Medical Journal*, October 8, 1949, Supplement page 161). *The Lancet*, while deprecating the present influence of the National Health Service in "fostering, rather than restraining, the bottle of medicine habit", feels that others, besides old-age pensioners, should get their medicines free, and suggests that people who have long illnesses, poorer or larger families, where genuine hardship may result, would also seem worthy of consideration in this connexion. In such cases the charge may mean "the re-erection of a barrier, if a small one, in the way of medical treatment". No detailed scheme is available yet, and so it is not known how the money is to be collected, by doctor or by chemist, whether it applies to all prescriptions, whether given by the general practitioner and by the specialist in the hospital service and as to whether the charge will be the same for a six-ounce as for a twenty-four-ounce bottle. The actual words used by the Prime Minister were, "for each prescription under the National Health Service" (*British Medical Journal*, October 29, 1949, Supplement page 189).

"We Must Take the Current when it Serves or Lose Our Ventures."

As a rule a medical journal is not regarded as a proper place for the probing of political problems, but with the growth of the welfare State, in which medicine, in its widest sense, plays such a prominent, even a principal part, some latitude may be occasionally allowed. In such a survey party

bias can have no place and any opinions expressed should be taken from non-partisan sources, in this case *The Times* and *The Spectator*, well-known London publications. Devaluation of the pound has been often discussed, but the Chancellor of the Exchequer, Sir Stafford Cripps, has always denied any such intention. However, after a visit to Washington, he announced in a broadcast on the evening of Sunday, September 17, that the value of the pound sterling would be reduced forthwith from \$4.03 to \$2.80. He added that this would lead at once to an increase in the price of bread (from 4½d. to 5½d.) and flour, but denied any other rise in prices "at any rate for the time being". Devaluation, he said, was taken to avoid heavy unemployment and any breakdown in the social services. Financial experts recognized the wisdom of the Chancellor's action, but both *The Times* ("The next step") and *The Spectator* ("Devaluation is not enough") called for an immediate and clear lead as to what other measures were proposed to take advantage of the breathing space gained by devaluation. A leader writer in *The Times* prophesied a lower standard of life and called for "much harder work as well as better management". He feared that the Government "may go on relying too much on exhortation and too little on positive and national economic acts". "Will they (the Government) above all, make the way more open for those who alone are capable by their initiative and hard work of bridging the dollar gap." Parliament was in recess, but at the request of the Opposition was recalled. When members met on September 27 the Chancellor announced an increase from 25% to 30% in tax on profits distributed by companies and added "there can be no justification for any section of workers trying to recoup themselves for an increase in the cost of living due to the altered exchange rate". Mr. Churchill in a frankly party speech, which was answered in the same strain by the Minister of Health, Mr. Bevan, accused the Government of having no real plan, but of merely resorting "to one temporary expedient after another". He felt that the only satisfactory answer to the country's trouble lay "in an appeal to the country and a new Parliament". On a vote this was defeated by 352 votes to 222 and the House rose. *The Spectator* felt that the Chancellor had pointed out rightly that to benefit from devaluation there must be increased production without any increase in home consumption. "But, at the crucial point, he had failed to give any indication of a government lead towards the new efforts and sacrifices." "What should have been the occasion of a united national effort had been turned into an open political quarrel, with the Government asking for a vote of confidence, and at the same time behaving in such a manner that that vote cannot possibly be given." Pending the reassembling of Parliament on October 18, discussions ranged widely over all aspects of the problem. Two popular subjects were whether or not a general election would be held before the end of the year and what would be the economies proposed by the Government. The Chancellor was criticized for his optimistic estimate of only a 1% rise in the cost of living; 6% to 10% was thought nearer the mark. Industrialists felt that more than the estimated 30% increase in exports would be necessary to earn the necessary dollars and stressed the difficulty in lowering the prices of goods exported, in face of the certain rise in those raw materials bought in the hard currency countries. *The Spectator* commented acidly that "heartily exhortations to business men, by Ministers without a day's experience of business, tend to be more irritative than effective. They are in a way superfluous, for one of the little recognized virtues of private enterprise is that persons engaged in it are compelled to seek a profit where they can see one". The air was cleared a good deal by the Prime Minister's announcement on October 13 that there would not be a general election this year. On this *The Times* felt that "by deciding to remain in office the Government were challenging themselves" and called on them to produce the plan they had had over three months to prepare and which would "call for harder work, longer hours and a greater sense of endeavour . . . throughout the whole community". In deciding on economies, one great difficulty the Government had to face related to wages which are assessed differently in different unions. At the moment wage claims of one sort or another are pending in eight industries and occupations. This necessitated consultations with the trades union representatives and led to delay. Parliament reassembled on October 18, and on October 24 the Prime Minister announced the proposed economies which will amount to £250m. in a full year, but some will not have much effect till well on into 1950. They are spread over a wide field, including a reduction in government administrative expenses, some of which will be made possible by "the dropping of some refinements of control". The most important changes from the general medical aspect are the charge for each bottle of medicine

given under the National Health Service, one penny rise in the price of school meals, and a reduction in the transport facilities for bringing children to school, an increase in the price of dried and frozen eggs and raisins, removal next year of the subsidies for fish and animal feeding stuffs and a cut of £35m. in the housing programme, mainly at the expense of the private builders. One result, not pleasing to doctors, was an immediate rise of 2½d. on the gallon of petrol. With a yearly budget in the neighbourhood of £4,000m. the general impression was that the cuts were lower than was expected. *The Times* described the Prime Minister's speech as an anticlimax and said that the economies were "too small, too slow in their effect and too uncertain of achievement". *The Spectator*, in an article headed "Funking the Fences", also quoted "too little and too late", and felt this comment "embodies the whole truth about the government programme". The writer of the article suggested that more should be saved over the health service and the food subsidies which cost about £300m. and £465m. respectively each year. "Families will be able to pay a higher price for food should pay it, and the others be compensated, on such a scale as to leave their position virtually unchanged, through the grant of higher family allowances, pensions and other amenities." "It has been calculated that £3 could, without hardship, be saved from subsidies for every £1 added in compensation to family allowances." The article concludes: "But what ought to disturb the Government most is a realization of the effect on effort of crying crisis and then proposing measures so anemic as to convince the country that there is no crisis after all. The psychological, not the financial, blunder is the capital offence." *The Manchester Guardian*, generally friendly to the Cabinet, is equally scathing, and traces their attitude to fear that stern measures would have a bad effect at the next general election, anxiety not to offend the trades unions by any substantial rise in the cost of living, and to avoid a split in the Cabinet. So the matter rests.

"In Lighter Vein."

Mr. Punch reports "A smoker's lament".
"If I smoke, I'm broke.
If I refrain, I'll go insane.
Choice is plain enough: suicide—or snuff."

Correspondence.

THE MEDICAL BENEVOLENT ASSOCIATION OF NEW SOUTH WALES.

SIR: As the Christmas season approaches, may I take this opportunity of drawing the attention of your readers to the Christmas appeal for funds by the Medical Benevolent Association of New South Wales.

A heavy increase in calls for assistance during the past year makes it especially necessary that there should be a ready and generous response from the profession if the association is to continue its present scale of help to the beneficiaries in these times of high and rising prices.

Yours, etc.,

R. J. WHITEMAN,
President, the Medical Benevolent
Association of New South Wales.

135 Macquarie Street,
Sydney,
November 22, 1949.

E. AND S. LIVINGSTONE, LIMITED.

SIR: Mr. Chas. Macmillan, managing director of E. and S. Livingstone, Limited, medical publishers, of Edinburgh, will shortly visit this country. He is due to arrive towards the end of December and return again about the middle of March, 1950. He has also planned to fit in a trip to Christchurch, Dunedin, Wellington and Auckland from January 12 to February 2.

He will be pleased to call upon any member desirous of meeting him, if written to care of "Gairloch", 9 Bishop Street, Petersham, New South Wales, or Box 2478V, Melbourne.

Melbourne,
November 14, 1949.

Yours, etc.,
J. COCHRANE.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 78, 80, 81 and 83, of October 27 and November 3, 10 and 17, 1949.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Fixing Rates of Pay.—Surgeon Lieutenant-Commander Robert Michael Coplans to be paid the rates of pay and allowances prescribed in the Naval Financial Regulations for Surgeon Commander, whilst acting in that rank, dated 9th March, 1949.

Termination of Appointment.—The appointment of Thomas Bowen Ready as Surgeon Lieutenant (for short service) is terminated, dated 10th March, 1949.

Appointment.—Benjamin Crawshaw is appointed Surgeon Lieutenant-Commander (for short service), subject to such appointment being deemed to be temporary service for the purpose of the *Defence Forces Retirement Benefits Act*, 1948, dated 1st October, 1949.

Emergency List.

Termination of Appointment.—The appointment of Surgeon Commander (Acting Surgeon Captain) David Shields Prentice for temporary service is terminated, dated 30th September, 1949.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Termination of Appointment.—The appointment of Newton Symonds Chalk as Surgeon Lieutenant is terminated, dated 22nd August, 1949.

Royal Australian Naval Volunteer Reserve.

Appointments.—Peter Eric Blaubaum is appointed Surgeon Lieutenant, with seniority in rank of 20th November, 1944, dated 29th June, 1949. Russell Geoffrey Cole is appointed Surgeon Lieutenant, with seniority in rank of 20th November, 1944, dated 28th June, 1949. Ian Campbell Galbraith is appointed Surgeon Lieutenant, with seniority in rank of 25th February, 1945, dated 26th August, 1949.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

Former Flying Officer B. T. Fairbridge (449651) is reappointed to a commission with the rank of Flying Officer, 3rd May, 1949.

The appointment of temporary Squadron Leader P. A. Deck (267790) is terminated on demobilization, 13th October, 1949.

Reserve: Medical Branch.

C. M. Davidson (272410) is reappointed to a commission with the rank of Flight Lieutenant, 18th August, 1949.

Public Health.

MEDICAL OFFICERS FOR MIGRANTS IN CAMPS AND HOSTELS.

THE following statement is published at the request of the General Secretary of the Federal Council of the British Medical Association in Australia.

The Director-General of Health of the Commonwealth, Dr. A. J. Metcalfe, has requested the help and advice of the Federal Council of the British Medical Association in the problem of providing medical attention to newly arrived migrants who are accommodated in camps and hostels in the various States of the Commonwealth.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 12, 1949.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory. ²	Australian Capital Territory.	Australia. ³
Ankylostomiasis	•	2(2)	•	•	•	•	•	•	2
Anthrax	•	•	•	•	•	•	•	•	•
Beriberi	•	•	•	•	•	•	•	•	•
Bilharziasis	•	•	•	•	•	•	•	•	•
Cerebro-spinal Meningitis	1	•	•	•	•	•	•	•	1
Cholera	•	•	•	•	•	•	•	•	•
Coastal Fever(a)	•	•	•	•	•	•	•	•	•
Dengue	•	•	•	•	1	•	•	•	1
Diarrhoea (Infantile)	•	•	6(6)	•	•	•	•	•	6
Diphtheria	5(3)	5(5)	7(6)	•	5(3)	•	•	•	22
Dysentery(b)	•	1(1)	•	1(1)	•	•	•	•	2
Encephalitis Lethargica	•	•	•	•	•	•	•	•	•
Erysipelas	•	•	•	1(1)	•	•	•	•	1
Filariasis	•	•	•	•	•	•	•	•	•
Helminthiasis	•	•	•	•	•	•	•	•	•
Hydatid	•	•	•	•	•	1	•	•	1
Influenza	•	•	•	•	•	•	•	•	•
Leprosy	•	•	•	•	4	•	•	•	4
Malaria(c)	•	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)
Measles	•	•	46(23)	•	•	•	•	•	46
Plague	•	•	•	•	•	•	•	•	•
Pollomyelitis	6(4)	11(5)	•	29(23)	1	•	•	•	47
Psittacosis	•	•	•	•	•	•	•	•	•
Puerperal Fever	•	•	•	•	•	•	•	•	•
Rubella(A)	•	•	5(4)	•	4(1)	1	•	7	17
Scarlet Fever	41(25)	18(11)	7(2)	4(4)	13(13)	1(1)	•	1	85
Smallpox	•	•	•	•	•	•	•	•	•
Tetanus	•	•	•	•	2(1)	•	•	•	2
Trachoma	•	•	•	•	•	•	•	•	•
Tuberculosis(d)	19(13)	18(13)	10(7)	9(6)	7(5)	3	•	1	67
Typhoid Fever(e)	1	•	1	•	1	•	•	•	3
Typhus (Endemic)(f)	•	•	•	•	2(2)	•	•	•	2
Undulant Fever	•	•	•	•	•	•	•	•	•
Well's Disease(g)	•	•	•	•	•	•	•	•	•
Whooping Cough	•	•	•	27(9)	•	•	•	•	27
Yellow Fever	•	•	•	•	•	•	•	•	•

¹ The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 26, 1944-1945. Figures in parentheses are those for the metropolitan area.

² Figures not available.

³ Figures incomplete owing to absence of returns from Northern Territory.

⁴ Not notifiable.

(a) Includes "Mossman" and "Sarina" fevers. (b) Includes amoebic and bacillary. (c) Statistics inexact with varying practice with regard to relapses in service cases infected overseas. (d) Includes all forms except in Northern Territory, where only pulmonary tuberculosis is notifiable. (e) Includes enteric fever, paratyphoid fevers and other *Salmonella* infections. (f) Cases reported include scrub, murine and tick typhus. (g) Includes leptospirosis, Well's and para-Well's disease. (A) Notifiable disease in Queensland in females aged over fourteen years.

He has been assured that the Federal Council and the medical profession generally would be very ready to assist in meeting this national responsibility.

Many of the camps are located in country areas away from larger centres of population and the chief need is for whole-time resident medical officers living in the camps. In other camps part-time service of practitioners in neighbouring towns has been made available and the Director-General of Health has expressed his appreciation of the valuable help already provided by local practitioners.

Some 50,000 migrants have already arrived and it is expected that even larger numbers will arrive within the next few months.

The services of younger medical men not yet established in practice are particularly being sought, and appointments may be on either a short term or longer term basis. The present salary offered is at the rate of £1262 *per annum*.

It is desired that the needs of the situation should be particularly brought under notice, and any members of the profession who are available for these appointments should communicate with the Director-General of Health, Canberra, who will be able to supply further particulars.

Bibliography of Scientific and Industrial Reports.

The following bibliographies, summaries of information and special reports have been prepared by the Council for Scientific and Industrial Research Information Service. Copies may be obtained on application to the Officer-in-Charge, C.S.I.R. Information Service, 314 Albert Street, East Melbourne, C.2. The bibliographies are, in the majority of cases, selective only. Applicants should state clearly the reason the bibliography *et cetera* is requested, because the number of copies available is limited.

B382: "Use of Radioelements in General Biology, Bacteriology, Parasitology", May, 1949 (115 references).

B395: "Use of Radioelements in Zoology", August, 1949 (24 references).

B396: "Applications of Radioisotopes in Biochemistry", August, 1949 (31 references).

Obituary.

JAMES EDWARD RAMSAY.

We regret to announce the death of Dr. James Edward Ramsay, which occurred on November 14, 1949, at London.

LESLIE OSBORNE MACNAMARA.

We regret to announce the death of Dr. Leslie Osborne Macnamara, which occurred on November 18, 1949, at Launceston.

RUSSELL WILLIAM RICHARDS.

We regret to announce the death of Dr. Russell William Richards, which occurred on November 22, 1949, at Blackheath, New South Wales.

THE FEDERAL MEDICAL WAR RELIEF FUND.

The following contributions to the Federal Medical War Relief Fund have been received:

New South Wales.

R. L. Douglas (second contribution), £10.
P. H. Doyle (second contribution), £5 5s.
Total: £15 5s.

Medical Appointments.

Dr. G. M. Reid has been appointed Deputy Director, Maternal and Child Welfare, Department of Health and Home Affairs, in pursuance of the provisions of *The Public Service Acts, 1922 to 1948*, of Queensland.

Dr. R. A. McCullagh has been appointed government medical officer at Millmerran, Queensland.

Diary for the Month.

- DEC. 6.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- DEC. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- DEC. 7.—Victorian Branch, B.M.A.: Annual Meeting.
- DEC. 7.—Western Australian Branch, B.M.A.: Council Meeting.
- DEC. 8.—New South Wales Branch, B.M.A.: Branch Meeting.
- DEC. 9.—Queensland Branch, B.M.A.: Annual Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester United Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

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